MINING WORLD

in this issue

Barvue Mines: Canada's Newest Zinc Producer

Page 40

MARCH 1953

Vol. 15 No. 3

35 cents a copy
In sterling 3s

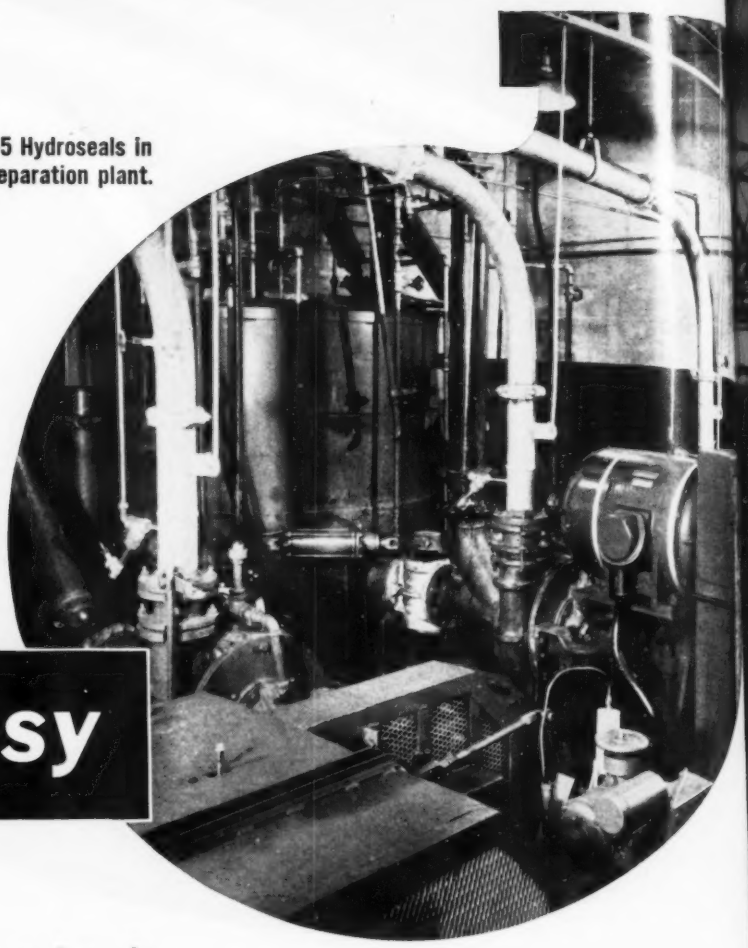
MECHANICAL LOADING

at drawpoints increases production, lowers development costs, reduces maintenance and saves time. Write Eimco for information.

EIMCO

THE EIMCO CORPORATION

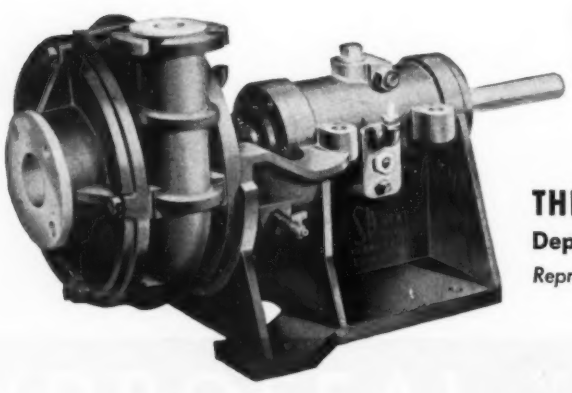
Three of the twelve B-3-5 Hydroseals in a large southern coal-preparation plant.



made easy

There's nothing like good steady pumps to make things easy for all hands in a coal-preparation plant. Take this big installation at Concord, Alabama, for instance. Day in, day out, they wash 1000 tons per hour with the help of twelve B-Frame Hydroseals, including stand-bys. And, from top management down to the operators who throw the switches, there's real enthusiasm for the economy, efficiency, and low maintenance of these pumps.

If you know someone who's been operating Hydroseals in his mill, get the good word from him. In the meantime, write for your copy of our latest catalog — it will tell you why he likes them.



THE ALLEN-SHERMAN-HOFF PUMP CO.
Dept. J—259 E. Lancaster Ave., Wynnewood, Pa.
Representatives throughout the World

HYDROSEAL

MOVING A MOUNTAIN OF IRON

JUST before winter locks the Great Lakes, mountains of iron ore hit the docks for shipment and must be stock-piled in a hurry. To handle this rough, rush job for the Pittsburgh Dock Co., A. J. Baltes, Inc., of Norwalk, Ohio, uses a Caterpillar Diesel DW20 Tractor and No. 20 Scraper, push-loaded with a D8 track-type Tractor.

"I like the long-life performance of Caterpillar equipment," foreman K. H. Myers says. His earthmovers are on the go 10 hours a day handling this iron ore, hauling 24-ton loads a half mile, 7 or 8 trips an hour. "And I like their economy, too," he adds, for his DW20 wheel-type Tractor needs only about 45 gallons of fuel a day, *one-half* the consumption of another manufacturer's unit on the same job.

There's extra power and capacity built into the Caterpillar DW20 Tractor and No. 20 Scraper team. The 225-HP Diesel engine in the tractor is precisely balanced with the 20-cu.-yd. heaped capacity of the scraper to give sustained, long-haul, high-speed, low-cost service. The scraper, with a flat, double-bottomed bowl, is cable-operated for fast, sure loading and spreading. And this is a *safe* rig, too: anti-jackknife devices, large air-actuated brakes and power steering give operators complete control and cut down-time due to damaged equipment.

Your Caterpillar Dealer will be glad to demonstrate. And remember, only genuine Cat parts can give you the genuine Caterpillar quality that's built into every one of these big yellow machines.

Caterpillar Tractor Co., San Leandro, Calif.; Peoria, Ill.

CATERPILLAR

REG. U. S. PAT. OFF.

DIESEL ENGINES
TRACTORS • MOTOR GRADERS
EARTHMOVING EQUIPMENT

Proved Performance

on the toughest jobs

On a wide range of jobs and under the toughest conditions, "Eucs" move more loads or tons per hour at the lowest cost. Large capacity, long life in heavy duty service, and speed on the haul and dump—these are features that assure low cost hauling and dependable performance.

Bottom-Dump Euclids have proved their rugged staying power and ability to do the toughest jobs in off-the-highway construction and industrial work. Powered by diesel engines of 190 to 300 h.p., they range in capacity from 13 to 25 cu. yds., and have top speeds loaded up to 34.4 m.p.h.

Rear-Dump "Eucs" are designed and built to move rock, coal, ore, overburden and other heavy excavation. They range in capacity from 10 to 34 tons, have top speeds up to 36.3 m.p.h. with full payload, and diesel engines of 125 to 400 h.p.

For help with your off-the-highway hauling problems, call your Euclid Distributor today or write for information on the complete line of Euclid equipment for moving earth, rock, coal and ore.

"EUCS" are job proved for more loads per hour and more profit per load.

The EUCLID ROAD MACHINERY Co., CLEVELAND 17, OHIO

EUCLIDS *Move the Earth*

MINING WORLD

Including the Export Edition **WORLD MINING**

Published monthly except in April when publication is semi-monthly

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THE COVER CIRCLE: Tubular conveyorways lead to Barvue's secondary crushing building, and from there to the mill at right. They work as well as they look. Less than a year ago the area was a mudflat. Today Barvue Mines Limited is operating the largest initial nonferrous mining and milling plant ever built in Canada—4,000 tons per day.

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GRAB SAMPLES From the Mail

Rum Jungle Reader

Dear Sir:

I am an American mining engineer employed by the Consolidated Zinc Pty. Ltd. and working through its subsidiary companies as a mining and exploration engineer. I am well acquainted with your technical publication. I would be pleased if you forwarded it to my new address where it is anticipated that I will be stationed for some time.

Robert C. James
Rum Jungle Private Bag
Darwin, N. T.
Australia

Ideas For Varying Conditions

Dear Sir:

I think **World Mining** should be of great value to all mining men. It brings plenty of new ideas tried under varying conditions in different countries which eliminates a lot of labor attached to the good old trial and error method. Seeing the new methods in front of one cuts out a lot of the lethargic attitude of "what was good enough last year is O.K. today."

The statistics in by copy are most interesting as one is inclined to only go into what is happening at home and forget the rest of the world.

P. S. Dike
Manager, Legion Mine
Antelope
Southern Rhodesia.

Served Many Useful Purposes

Dear Sir:

While in an executive position with an iron ore company in Liberia from 1946 to 1950 I regularly received the international edition of your magazine. It served many a useful purpose there in keeping us informed about the latest techniques, and, above all, in reporting the latest mining machinery developments.

Just that, and also the survey of international developments, is what I need in my present position in the field of my company's mineral interests. Please change my address as follows:

K. Koeten
Rotterdam,
The Netherlands

MINING WORLD

with which is combined

MINING JOURNAL

The Production Magazine of the Metal Mining Industry

Published at

SAN FRANCISCO, CALIFORNIA

$3.00 Per Year ..... 13 Issues

(Includes Mine Development and Directory Number)

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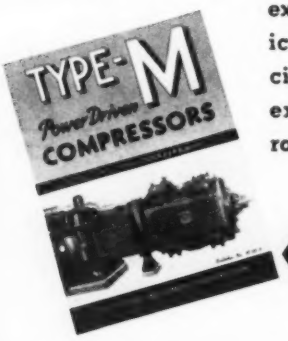
RECOMMENDED CURE for the high cost of air

. . . Cooper-Bessemer Motor Driven Compressors

IF your plans call for compressed air on a large scale, better have a close look at the savings modern Cooper-Bessemer units offer. Shown here is one of the various types and sizes from 350 to 5000 horsepower. These Cooper-Bessemers offer you exceptionally high mechanical and volumetric efficiencies, *throughout* an extremely broad demand range. With such flexibility and efficiency you can turn out more air per dollar.

What's more, the Cooper-Bessemer units have unmatched compactness among units comparable in flexibility, efficiency and life! Without sacrificing accessibility or ruggedness, you save on space, housing, installation and piping costs.

The nearest Cooper-Bessemer office will be glad to cooperate with you in every way and give money-saving facts on these modern compressor units as well as on Cooper-Bessemer gas, Diesel and Gas-Diesel engines for every heavy-duty service.



Send for your copy of this new bulletin covering the features, capacities, dimensions, weight, etc. of the Cooper-Bessemer power-driven Type M compressors, 200 to 1,000 hp. Other bulletins covering still larger sizes are also yours for the asking.

The Cooper-Bessemer Corporation

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IS HELPING PLANT MEN SOLVE PROBLEMS IN

METALWORKING **HEAT TREATING** **LUBRICATION**

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Houghton's Western Representatives are ready to give you on-the-spot service wherever or whenever you need it. They'll gladly work with you—in your plant and on your problem—to help you improve your metal processing procedure, cut production costs, improve product quality and increase production.

WITH FOUR WESTERN OFFICES

No matter where your plant is located, a Houghton Man is near you. Your requests for engineering help are welcomed any time, from anywhere . . . and will get prompt attention and action. A post card, letter or phone call is all that's needed to get *your* Houghton Man on *your* job quickly.

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When you call on Houghton, you can depend on time-saving delivery because they ship from stock, in Houghton's San Francisco plant. When you do business with Houghton, you deal with local people interested in and associated with local industry.

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here's muscle to move mountains | IN 6 YARD BITES!

LIMA TYPE 2400—The largest member of the Lima family is engineered and constructed for heavy duty service with higher dump, greater reach, and faster digging cycle.

EASY INSTANT CONTROL — Smooth, "Precision" air control of travel and operating motions lessens operator fatigue. Anti-friction bearings, reduce power robbing friction and step up efficiency.

BIG YARDAGE PRODUCER— Maximum power and fast digging cycles originate from a husky 12 cylinder Diesel engine of approved make. Equipped with torque converter power take-off.

LOW OPERATING COSTS — Truck and rotating bases are integrally cast for extra-rigidity and long life. Adjustments rarely needed on full mechanical clutches. Easy maintenance.

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Construction Equipment Division

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Construction Equipment Division
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FOR TOUGH PROBLEMS IN

Agitating	Mining
Aerating	Milling
Mixing	Processing
Blending	Chemical
Conditioning	Industrial
Scrubbing	Food
	Foundry

EVERY PARTICLE MIXES

Feed normally enters directly into the standpipe top . . . is sucked down and is positively mixed by the propeller at the lower end. Thus, there can be **no** short circuiting of pulp as every particle is thoroughly agitated and mixed.

EVERY PARTICLE RECIRCULATES

Pulp movement in the tank is constantly toward the adjustable central standpipe due to the sucking and mixing action of the propeller and the resulting controlled vortex down the standpipe. Intermediate recirculation ports may be opened or closed depending on the treatment process.

FEED LOW...DISCHARGE HIGHER

A feed port is available directly to the lower end of the standpipe. Since discharge is at a higher point, an actual gain in elevation can be had for series applications.

NO SANDING UP

For intermittent operation or between shifts, there is no problem of "digging out" as the replaceable alloy iron standpipe flange prevents "sanding in" of the propeller.

SIZES 3' x 3' to 20' x 20'

Write for Deco Bulletin A2-B2, containing detailed information and pulp density charts for calculating size required.

DECO FLOTATION ENGINEERS — DENVER EQUIPMENT 24 HOUR SERVICE COMPANY

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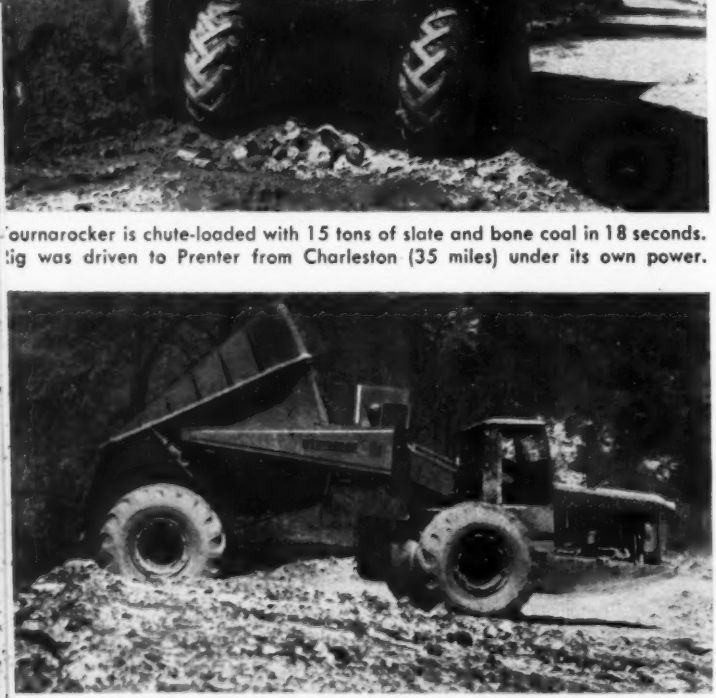
DENVER EQUIPMENT COMPANY

1400 SEVENTEENTH STREET · DENVER 17, COLORADO

240 tons hourly at Red Parrot Mine

Tournarocker is chute-loaded with 15 tons of slate and bone coal in 18 seconds. Rig was driven to Prenter from Charleston (35 miles) under its own power.



Arriving at dump, Tournarocker backs to edge of bank. Big 4-wheel air brakes, plus front-wheel drive, give operator confidence for fast dumping, maneuvering.

1 "C" Tournarocker does

Coal miners today are working many seams never before considered practical — thanks to new techniques in drift-mining and refuse-removal. Take the two Red Parrot Coal Company seams near Prenter, West Virginia, for example. Here's how they operate:

Red Parrot (division of North American Coal & Dock Corp., Cleveland, Ohio) removes coal from the mine in 2½-ton cars... dumps it into a "rope and button" conveyor running to the tipple and washer. Refuse — mostly slate and bone coal — is conveyed to an overhead bin several hundred feet above the plant. Then . . . to complete the company's time-saving, labor-saving mechanization . . . Red Parrot hauls refuse from bin to dump with a C Tournarocker. Production records show this *one* 18-ton Rear-Dump does the work of *three* 6 to 8-ton dump trucks on the refuse-removal operation.

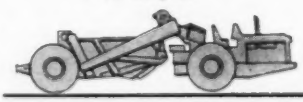
16 loads per hr. on 3000' cycle

Working 2 shifts a day regardless of weather, Tournarocker is chute-loaded at the bin with

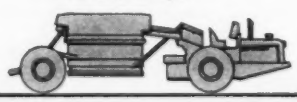
INTERCHANGEABLE FOR EXTRA PROFITS

same prime-mover is readily interchanged for use with scraper, bottom-dump, flat-bed, or crane. Assures year-round profits.

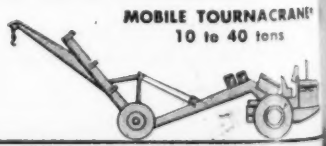
TOURNAPULL* SCRAPER
7 to 42 yds.



BOTTOM-DUMP TOURNAHOPPER*
18 and 27-yd.



MOBILE TOURNACRANE*
10 to 40 tons



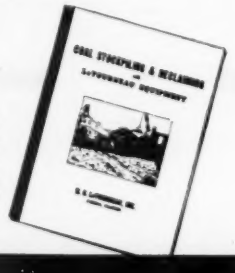
Tournarocker speeds from conveyor bin to dump in 3rd gear with full load of refuse. After 2,000 hours operation, owners report 98% mechanical efficiency.

...does work of 3 trucks

15 tons of slate and bone coal in an average of 18 seconds. It hauls 1500' to the dump in 1 minute 24 seconds . . . dumps in 6 seconds . . . and returns to the bin in 1 minute 20 seconds, for an average speed of 12.6 m.p.h. Rig completes the 3000' round trip in 3 minutes 6 seconds . . . makes 16 trips per 50-minute hour. Hourly production averages 240 tons. No wonder Outside Superintendent F. Mason Morgan says, "We are well pleased. Tournarocker works better than any rubber-tired equipment we've used." He adds, "Operator efficiency is up, too."

Get facts for your work

Whenever you have rock, ore, or shovel-dirt to move, your best bet is Tournarocker. Available in sizes from 9 to 50 tons, 122 to 450 h.p. Constant-mesh transmission, torque converter, electric body heating unit, are optional. See your LeTourneau Distributor for factual job reports on work like yours. Let him arrange to show you rear-dump Tournarockers at work in your area.



COAL STOCKPILING BOOK shows how mobile LeTourneau builds stockpile and compact coal without expensive fixed structures. It may be helpful to encourage power customers to stockpile more coal. If you'd like copies for your sales offices, drop us a line.

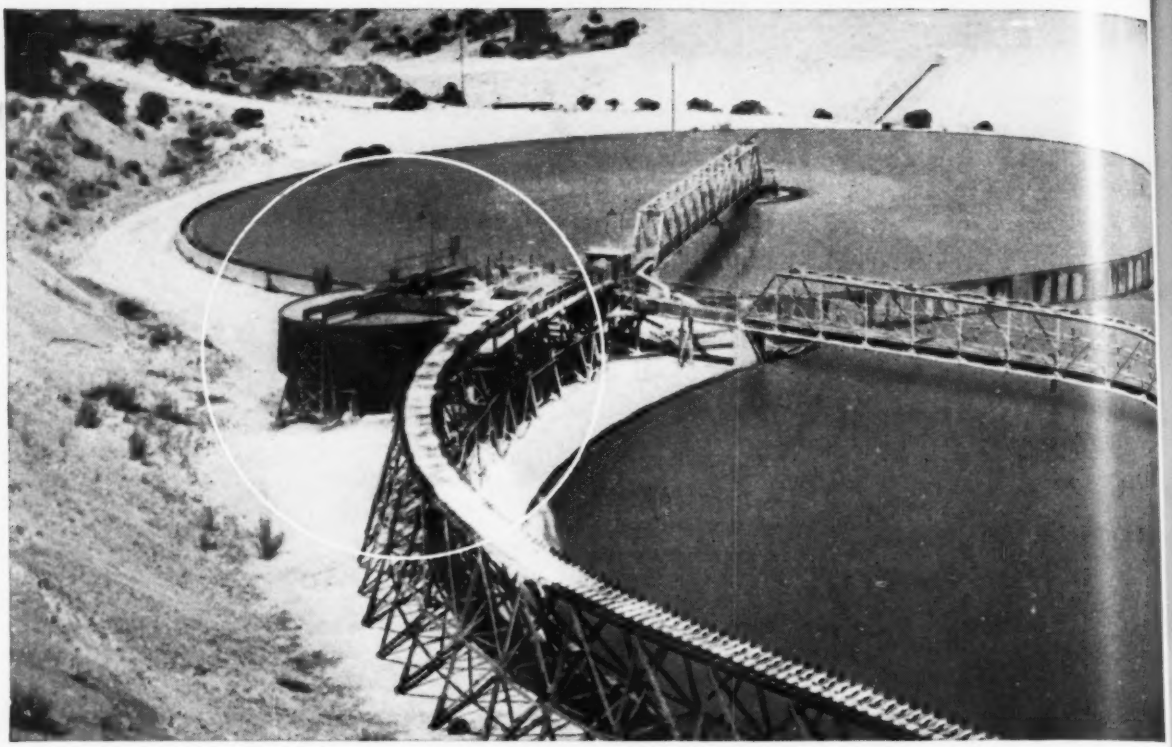
Rocker body tips to vertical, dumps instantly, clear over bank. Requires less clean-up, reduces cycle time. Rig's simple, sturdy design (no frame, no sub-frame, no springs, no hydraulics) saves on maintenance, too.

Tournarocker—Trademark Reg. U. S. Pat. Off. R-218-CM

LETOURNEAU LET EQUIPMENT

R. G. LeTOURNEAU, INC.

Peoria, Illinois



Smooth out your tailings operations

in spite of increased tonnage . . . changing ore characteristics

Here is how one operator solved the problem of increased tonnage and changing ore characteristics . . . with a Dorr Hydroseparator.

To handle a total of 12,000 tpd of copper flotation tailings at 26% solids, the initial installation included two Dorr Torq* Thickeners, each 225 ft. dia. When variables in ore characteristics reduced thickener capacity and increased water loss in the underflow, a Dorr Hydroseparator was installed ahead of the thickeners to compensate for shock loads. The Hydroseparator installation, resulting in better thickener performance, did two things:

1. Mill output *increased* by an average of 1,000 tons per working day.
2. The amount of water lost in thickener underflow *decreased* by 166 gpm.

The Summary of Operating Data shown here gives additional information, before and after the installation of the Dorr Hydroseparator.

To solve your tailings thickening problems, make use of our diversified experience in the field of metallurgical production. Let us know about your problems and we will work to solve them with you. THE DORR COMPANY, Barry Place, Stamford, Conn.

*Reg. U.S. Pat. Off.

Dorr Hydroseparator
Summary of Operating Data
Castle Dome Copper Co., Miami, Arizona

Year	Feed to System Avg. Tons Per Day	Character of Feed	Percent Solids Combined Underflow
	WITHOUT HYDROSEPARATOR		
1948 (Jan.-June)	10,406	Hard Ore	44.5
Dorr Hydroseparator Installed July 1948			
	WITH HYDROSEPARATOR		
1948 (Aug.-Dec.)	11,436	Hard Ore	45.2
1949	11,814	Variable Ore	46.4
1950	11,905	Variable Ore	47.8
1951	12,076	Variable Ore	47.9

Better tools TODAY to meet tomorrow's demand

DORRCO

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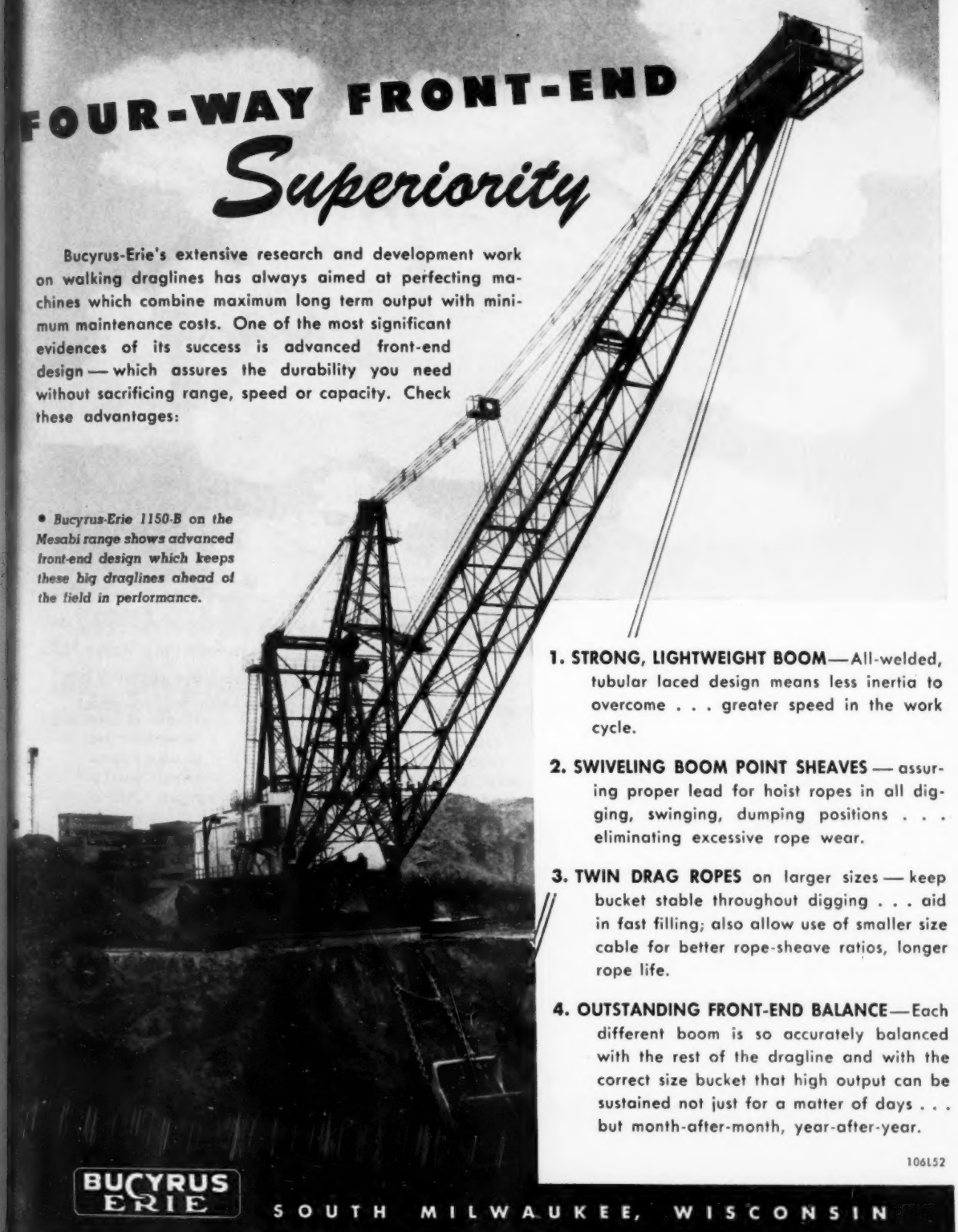
For Big Output on Big Jobs . . .

FOUR-WAY FRONT-END *Superiority*

Bucyrus-Erie's extensive research and development work on walking draglines has always aimed at perfecting machines which combine maximum long term output with minimum maintenance costs. One of the most significant evidences of its success is advanced front-end design — which assures the durability you need without sacrificing range, speed or capacity. Check these advantages:



• *Bucyrus-Erie 1150-B on the Mesabi range shows advanced front-end design which keeps these big draglines ahead of the field in performance.*

1. STRONG, LIGHTWEIGHT BOOM—All-welded, tubular laced design means less inertia to overcome . . . greater speed in the work cycle.

2. SWIVELING BOOM POINT SHEAVES — assuring proper lead for hoist ropes in all digging, swinging, dumping positions . . . eliminating excessive rope wear.

3. TWIN DRAG ROPES on larger sizes — keep bucket stable throughout digging . . . aid in fast filling; also allow use of smaller size cable for better rope-sheave ratios, longer rope life.

4. OUTSTANDING FRONT-END BALANCE—Each different boom is so accurately balanced with the rest of the dragline and with the correct size bucket that high output can be sustained not just for a matter of days . . . but month-after-month, year-after-year.

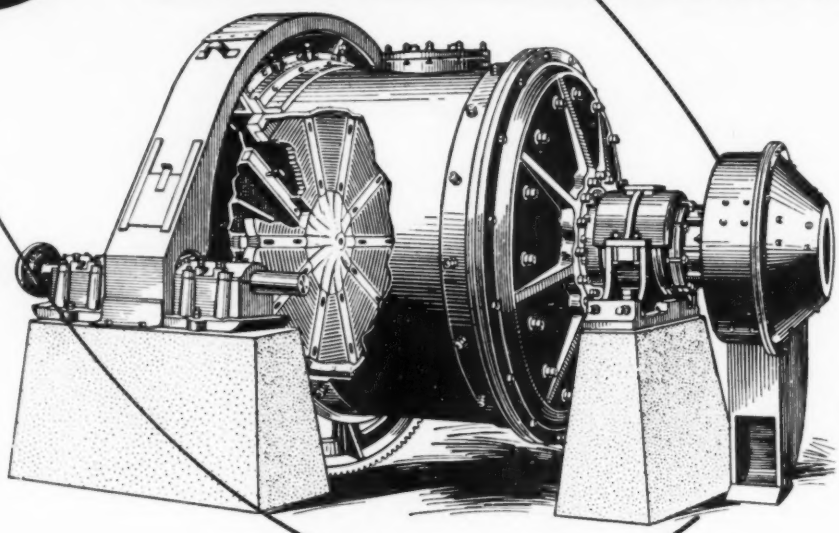
106L52

BUCYRUS ERIE

SOUTH MILWAUKEE, WISCONSIN

Worldwide Proof

# of MARCY MILLS' low cost performance



● Grinding mills are selected on the basis of low cost per ton output and efficient, dependable mechanical operation. That's why so many successful mining companies throughout the world use Marcy Mills. In addition to the many Marcy Mills chosen by both large and small U. S. companies, Marcy Mills have recently been the choice of leading companies (many repeat orders) in the following countries..

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PHILIPPINES	IRELAND	NEW ZEALAND	PERU	KENYA, E. AFRICA
ITALY	MOROCCO	GREECE	FRANCE	KUWAIT
AUSTRALIA	SO. RHODESIA	NOVA SCOTIA	AUSTRIA	

● Marcy Mills have also been sent to...

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ALASKA	EL SALVADOR ECQUADOR	SWEDEN	RHODESIA	INDIA
CUBA	VENEZUELA	ARGENTINA	NEW CALEDONIA	
CHINA	FINLAND	TURKEY	FIJI ISLANDS	

Get the ***facts***, actual operating data, on low cost per ton Marcy Mill performance from our grinding specialists.

The Mine & Smelter Supply Co.

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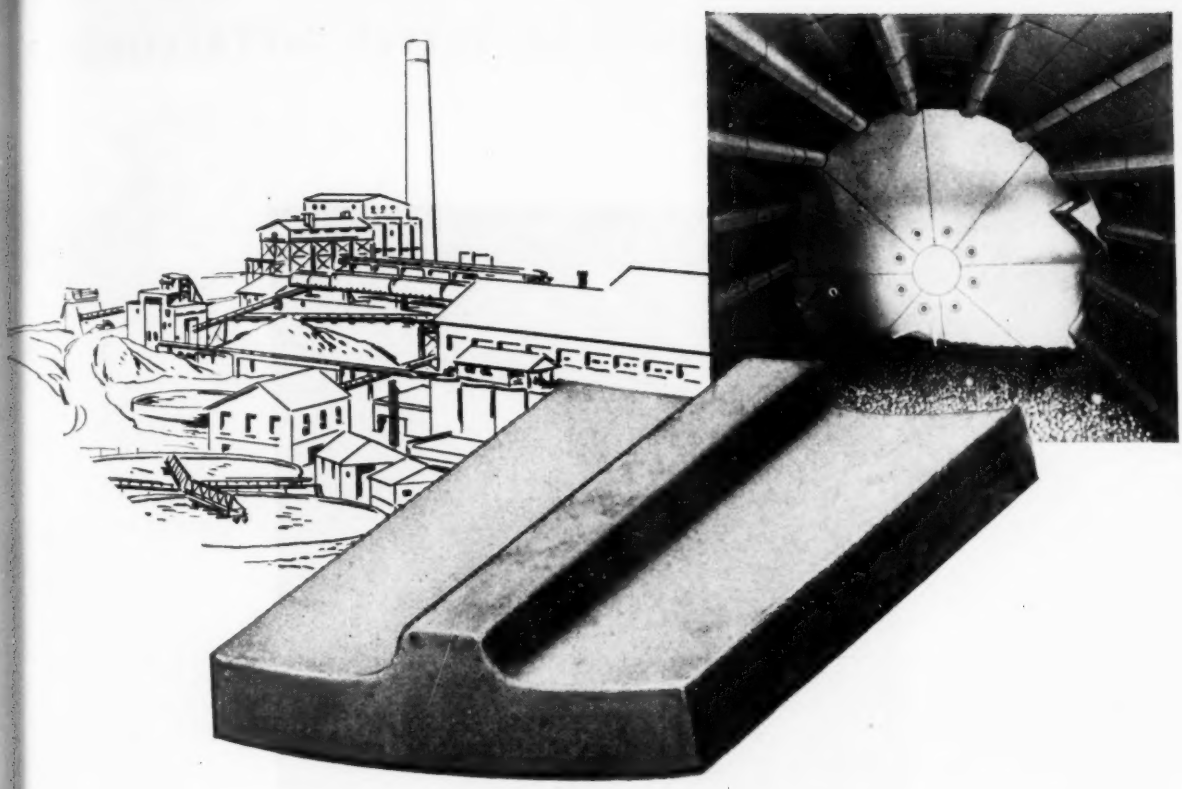


this LINER boosted production 35%

AMSCO Ball Mill Liners

Reduced Down-Time, Increased Production...

A large West Coast cement producer found that Ball Mill Liners were causing expensive trouble. Liners were thick—*over 3 inches*. This meant reduction in mill capacity. Thick liners also meant tremendous weight. Both thickness and weight reduced production and efficiency. *Liners wore rapidly*, too, causing frequent, expensive replacement jobs, with costly labor and material. And added to the bill was lost production due to mill down-time.

Well-known for their skill in handling impact and abrasion-resistant alloys, AMSCO engineers and foundrymen were consulted.

AMSCO solved the Ball Mill Liner problem.

AMSCO designed a new, light, thin—*1 inch thick*—liner, which because of lightness and thinness increased mill capacity, heightened efficiency. The new liners lasted beyond all expectations and in addition the segments were easier to install. These factors, plus reduced replacement down-time, have been responsible for a 35% *increase in production.*

AMSCO is the largest producer of Manganese Steel, "the toughest steel known," which has proven itself under countless abrasion and impact situations. And where the service conditions require it, AMSCO also produces Chromium-Molybdenum and Chrome-Manganese alloys.

If you have a tough wear problem and suspect that there may be a better alloy for your purpose, you are invited to write to AMSCO for further information.

AMERICAN Brake Shoe COMPANY

AMERICAN MANGANESE STEEL DIVISION

425 EAST 14th STREET • CHICAGO HEIGHTS, ILL.

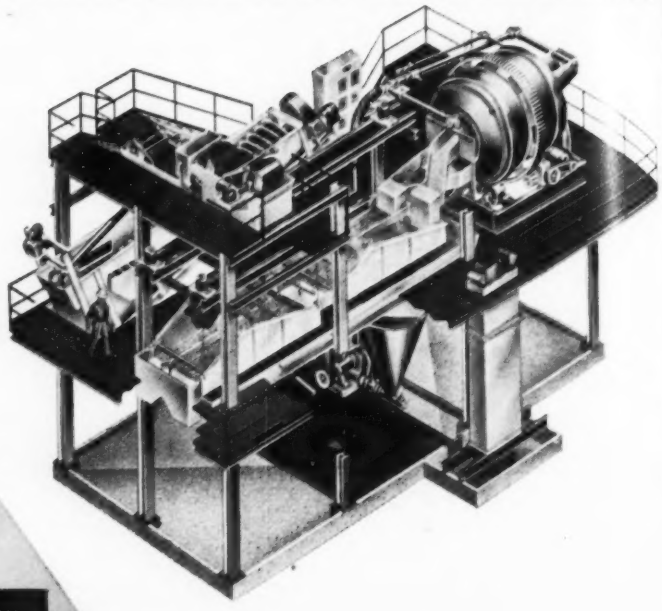
Foundries at Chicago Heights, Ill.; New Castle, Del.; Denver, Colo.; St. Louis, Mo.; Los Angeles, Calif.

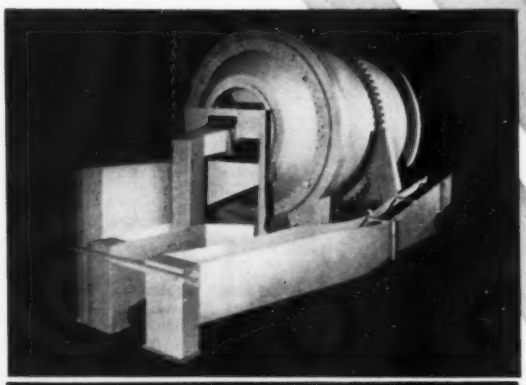
Offices in principal cities. In Canada: Joliette Steel Limited, Joliette, Quebec.

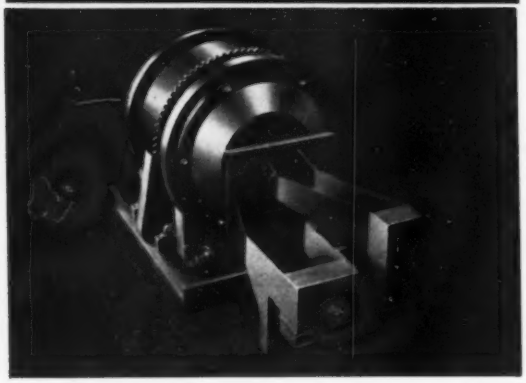
PRECISION CONTROL MEANS BETTER METALLURGY!

The WEMCO MOBIL-MILL gives you precise control of separating conditions with ores amenable to HMS.

WEMCO design allows accurate control of media density and positive sink removal—assures higher grade concentrate and lower tailings.







VERSATILE PERFORMANCE BOOSTS OPERATING PROFITS!

WEMCO MOBIL-MILLS give you **three** types of separators to choose from—fits the equipment to your problem for optimum operating efficiency:

1. **WEMCO** Double Drum Separator gives two stage separation in a single unit for treating ores having a middling component.
2. **WEMCO** Single Drum Separator gives positive sink removal and efficient control of media density for one stage separation over a wide range of size fractions.
3. **WEMCO** Cone Separator gives efficient, low cost separation on ores where a finer range of feed sizes requires greater volume of medium.

PREFABRICATION SPEEDS INSTALLATION, SIMPLIFIES OPERATION!

WEMCO MOBIL-MILLS are **prefabricated,** complete processing units manufactured to precise standards according to field-proven design. Mobil-Mills are quickly and easily installed by **your** mechanics or a **WEMCO** crew, are simple to operate and require a minimum of attendance.

7 MOBIL-MILL ADVANTAGES

- *Prefabrication*
- *Low initial cost*
- *Clean, sharp separation*
- *Fast installation*
- *Compact design*
- *Low operating cost*
- *Capacities 5 to 275 TPH*

Write today for descriptive bulletin and information on how a Mobil-Mill can improve your beneficiation problem.

WEMCO
WESTERN MACHINERY COMPANY
760-765 FOLSOM STREET · SAN FRANCISCO 7, CALIFORNIA

OTHER WEMCO PRODUCTS
Mobil-Mills · Coal Spirals · HMS Thickeners · HMS Pumps · Sand Pumps · Cone Separators · Drum Separators · Fagergren Laboratory Units · Agitators · Fagergren & Steffensen Flotation Machines · Hydroseparators · S-M Classifiers · HMS Laboratory Units · Dewatering Spirals · Thickeners · Conditioners · Deaerators

Dow

DOW XANTHATES ASSURE MAXIMUM RECOVERY

Superior collector reagents make separation of sulfide minerals fast and complete... reduce operational costs

Every bubble is loaded to maximum carrying capacity when Dow Xanthates are on the job. Improved results are easy to measure in greater recovery and higher concentrate grade.

Substantially nonfrothing, these Xanthates offer the operator freedom to regulate frother and collector independently. To allow a choice of selectivity, Dow offers a wide range of Xanthates—all possessing good collector power. All Dow Xanthates are now shipped in pelletized form for convenient, dust-free handling.

To learn more about Dow Xanthates and the savings they can effect in your milling operation, write to THE DOW CHEMICAL COMPANY, Midland, Michigan, *Dept. OC 3-38.*

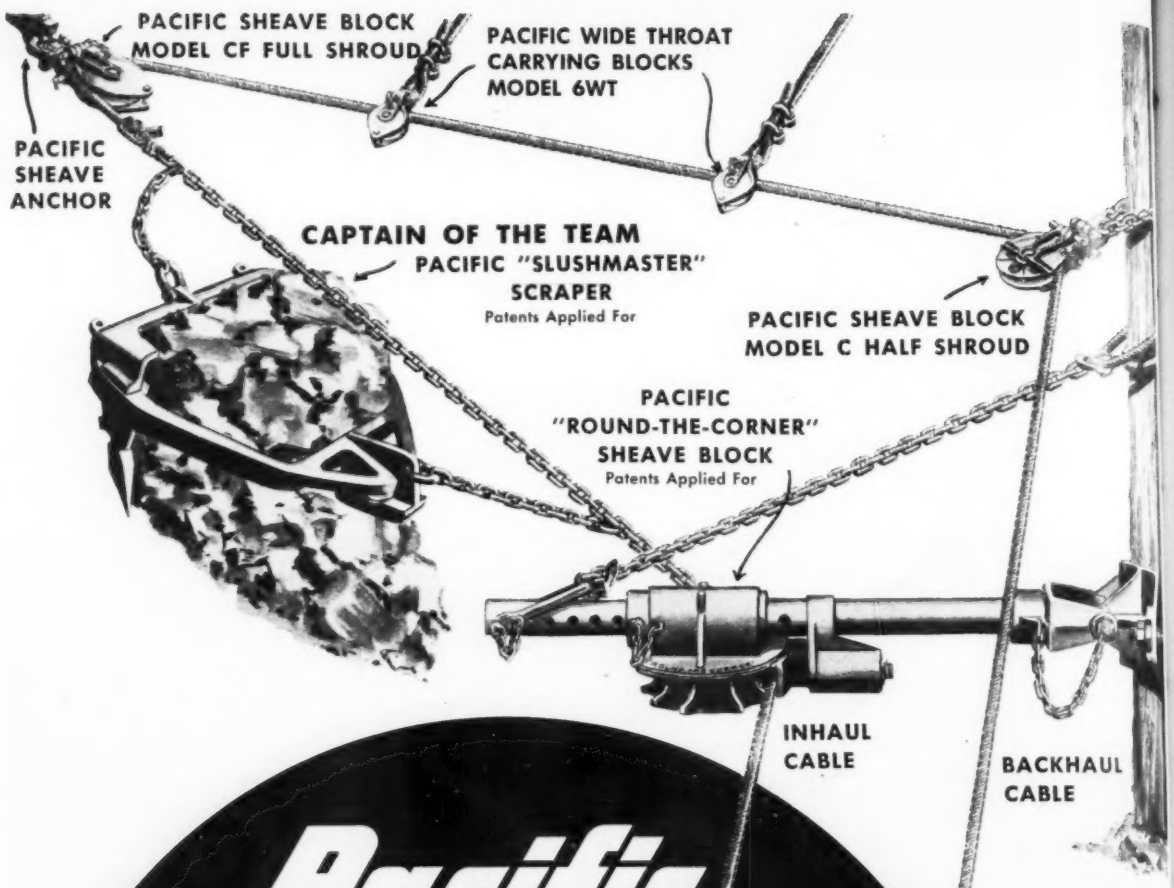
consider these

DOW (BEAR BRAND®) Xanthates

Z®-3 Potassium Ethyl Xanthate
Z-4 Sodium Ethyl Xanthate
Z-5 Potassium sec-Amyl Xanthate
Z-6 Potassium Amyl Xanthate
Z-8 Potassium sec-Butyl Xanthate
Z-9 Potassium Isopropyl Xanthate
Z-11 Sodium Isopropyl Xanthate

you can depend on DOW CHEMICALS

Dow



Pacific Teamwork Pays off

MORE ORE AT LESS COST

Pacific Products, working together, provide an unbeatable combination for getting out more ore at less cost. Write for Bulletin 215.

★

Be Specific — Order Pacific Jaw Crushers, Sheave Anchors, Bit Knockers and Pacific Wearing Parts.

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ALLOY STEEL & METALS CO.

1862 E. 55TH ST., LOS ANGELES 58, CALIFORNIA

MAILING ADDRESS:
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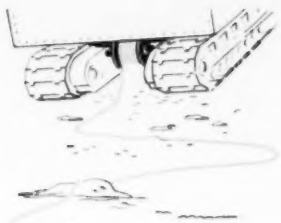
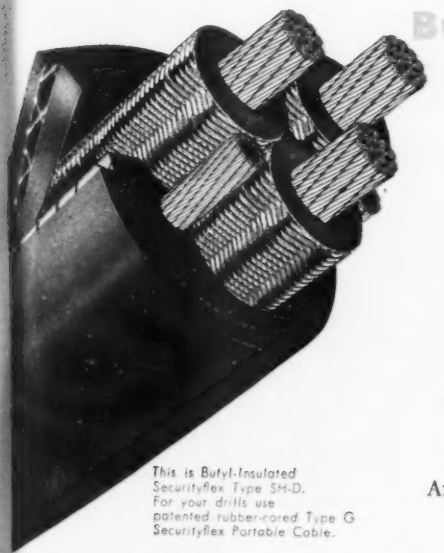


proved in our mines
for better performance in yours

We—at Anaconda—are miners ourselves. We know shovel cable because we use lots of it. Safety and uninterrupted flow of power are important in any mining operation. In both respects we know Securityflex Type SH-D has a good record.*

for longer "failure-free" service on big shovels, insist on
Butyl-Insulated Securityflex above 2kv



This is Butyl-Insulated Securityflex Type SH-D. For your drills use patented rubber-cored Type G Securityflex Portable Cable.

ANACONDA Securityflex Cable is safer, less liable to "blow-out," easier to work with. Here's why:

BUTYL INSULATION. This accounts for improved resistance to moisture, ozone, heat (up to 80C).

NEOPRENE JACKET. Here is real flexibility and great strength engineered for this specific tough use. Handles well, has high impact resistance and lasts longer in all weather.

RUBBER-CORED GROUND WIRES. This safety-first feature prevents kinking, gives greater shield contact, and cushions the wires.

COPPER-COTTON SHIELD. Special new-type shield makes splicing easier, faster without damage to insulation. Eliminates chafing failures.

Ask your Anaconda Sales Office or Distributor to show you this and other ANACONDA portable mining cables. Learn how continuous improvements have made these famous cables better . . . for safety . . . and for increased production at less cost in your mine. Anaconda Wire & Cable Company, 25 Broadway, New York 4, N. Y.

*Trademark 52860

the right cable for the job ANACONDA® **wire and cable**

THIS IS THE DIESEL

for any mining job from 32 H.P. up

Whatever your mining job, there's a General Motors Diesel to supply the power. For General Motors Diesel engines now power more than 260 different models of mining equipment built by over 50 manufacturers.

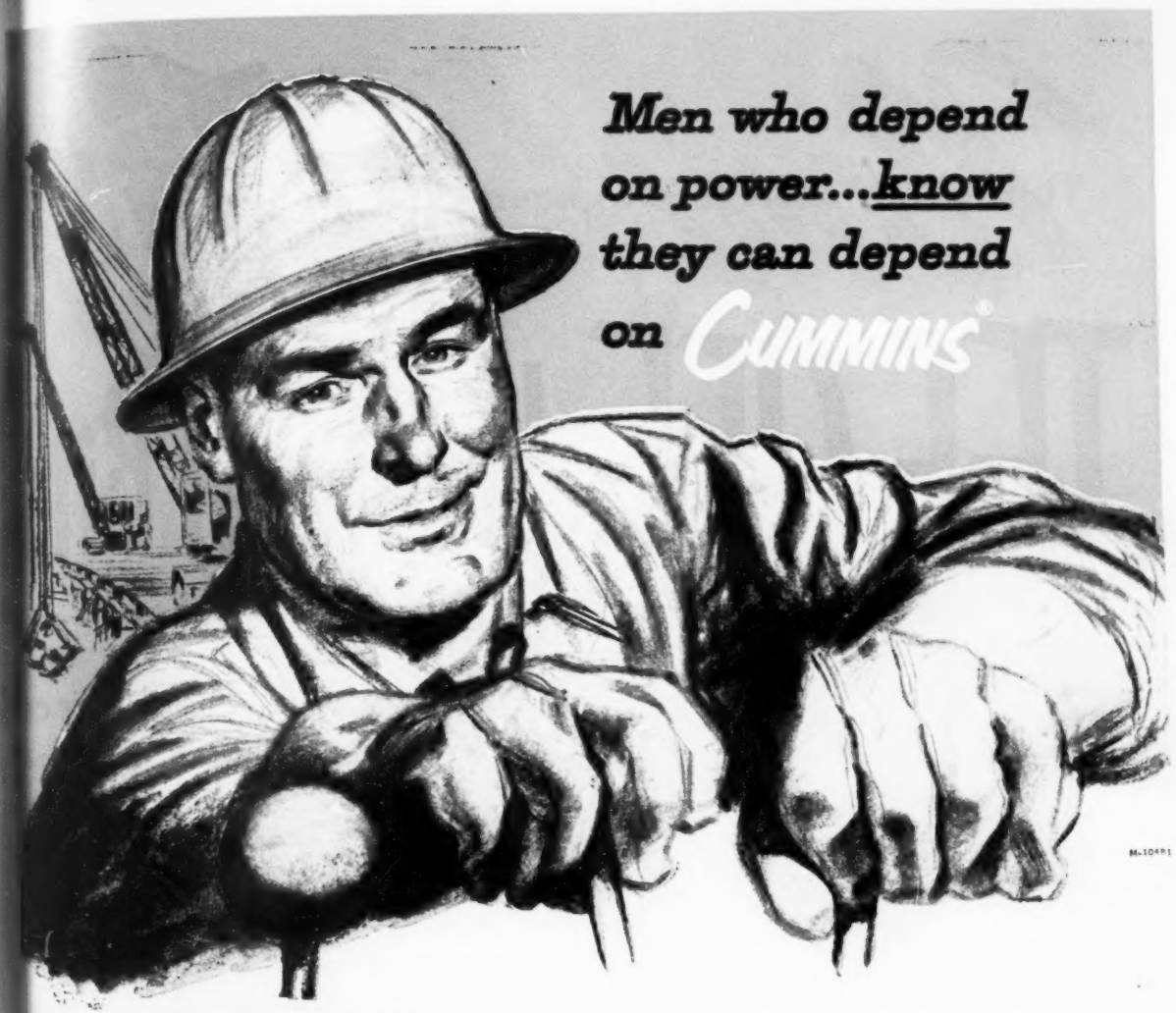
Widespread demand for the 2-cycle GM Diesel engine results from its ability to get more work done faster and at lower cost. GM Diesel's fast acceleration boosts production. Smooth 2-cycle operation reduces wear and extends engine life. Convenient location of accessories simplifies maintenance. What's more, GM Diesels definitely cost less to maintain and repair because parts cost less, are highly interchangeable and are available everywhere. See your GM Diesel distributor or write us for full information.

DETROIT DIESEL ENGINE DIVISION
GENERAL MOTORS · DETROIT 28, MICHIGAN
SINGLE ENGINES...32 to 275 H.P. MULTIPLE UNITS...Up to 840 H.P.

It pays to Standardize on

GM
GENERAL MOTORS
DIESEL POWER

Write for booklet, "A 50,000,000 Horsepower Insurance Policy" that tells you why.



CUMMINS DIESELS *are engineered to make light work of tough jobs*

Progressive, eyes-ahead engineering is one of the big reasons why so many mine and quarry operators pick Cummins Diesels for dependability.

Consider Cummins' exclusive system of fuel injection and metering—an important factor in the unequalled performance records established by lightweight, high-speed (60-600 h. p.) Cummins Diesels. No other Diesel fuel system is so simple...so rugged! It delivers a uniform, properly prepared fuel charge to every cylinder. All under low pressure—no chance of bursting and leaking fuel lines.

Your Cummins dealer will be glad to tell you more about the exclusive fuel system and other engineering advantages built into every Cummins Diesel. He is an expert who knows the requirements of your job. He heads up a specialized parts and service organization—equipped to handle all your diesel power needs. Call him today... or write!

CUMMINS

CUMMINS ENGINE COMPANY, INC., Columbus, Indiana
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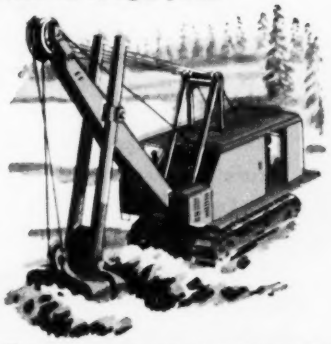

***Leaders** in rugged, lightweight, high-speed diesel power!*

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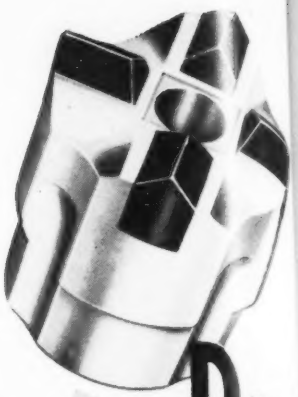
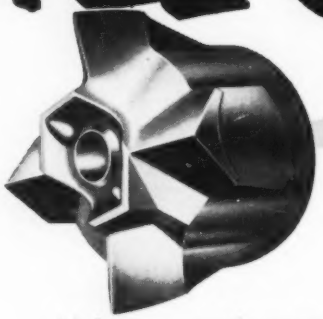
(1-19-53)

Now!

TEE CEE Liddicoat Bits

[Tungsten carbide inserts]





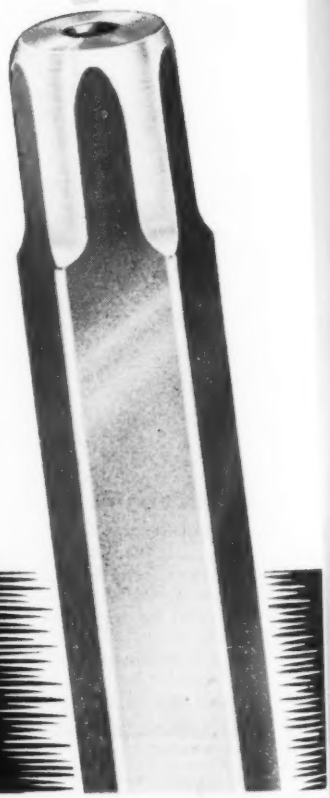
Liddicoat TEE CE
and "single use
bits both fit th
same drill stee

It's here . . . ready to go into action for you! It's the new Liddicoat Tee Cee (Tungsten Carbide insert) Bit, designed for on-the-job interchange with the famed Liddicoat Bit that is "used to destruction." Both fit the same steel. The same strong Liddicoat connection — no threads to strip — is used for both. With the new Tee Cee bit, users of Liddicoat now have a detachable bit best suited to conditions. The TEE CEE Liddicoat is the result of years of testing and research by the Western Rock Bit Manufacturing Company.

The socket of the Liddicoat TEE CEE bit is machined to an accuracy in thousands of an inch, a degree of precision that means a stronger connection and longer bit and rod life. Flat sections — four or six — within the socket correspond with the flat sections of the drill steel — securely locking the bit to the rod.

Equipped with the new TEE CEE bit and the Liddicoat single-use bit, users have assured performance and economy in all drilling operations.

Add your name to the ever-expanding Liddicoat list of mining and contracting firms that enjoy outstanding results at lower cost. Write today for detailed information.



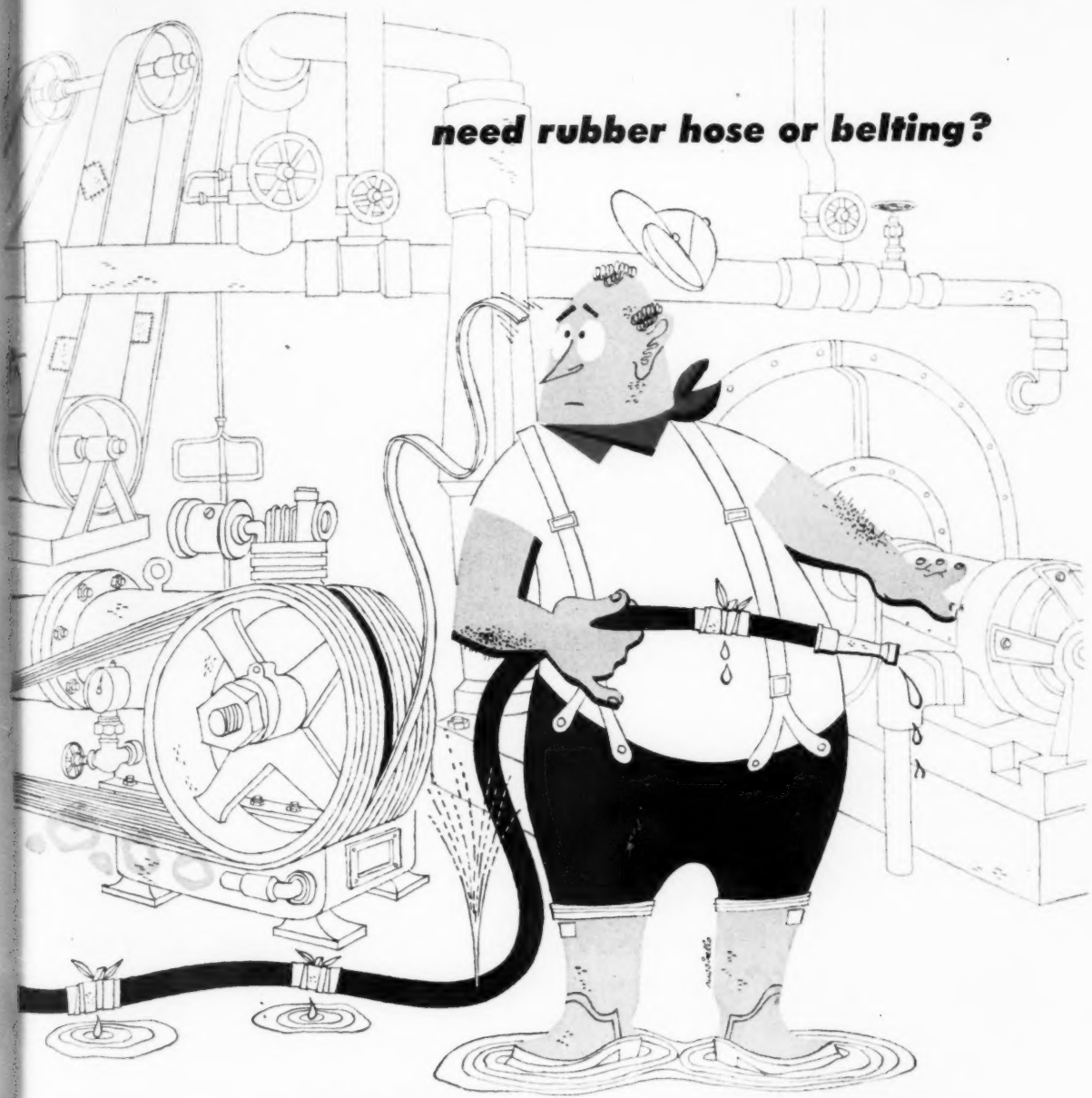
"Every Little Bit Counts"

Made in Salt Lake City by

WESTERN

Rock Bit Manufacturing Company

552 West 7th South • Salt Lake City 4, Utah



LET REPUBLIC SUPPLY YOUR INDUSTRIAL NEEDS!

He said: "I'm #??!!°°! tired patching hose and repairing belts all day! Got any over there that'll stand up under hard service?"

We said: "Sure thing! We carry top quality Goodyear hose and belting . . . famous for *extra* service. Any hose couplings you order will be put on free and and if you need any belt-splicing, we've got some real experts! Just give us the specifications and our truck will be on its way!"

The moral: When you let REPUBLIC SUPPLY your industrial needs you get highest quality supplies plus friendly, helpful assistance from experienced men who know your problems. We're a one-stop SERVICENTER with more than 35,000 different industrial supply items as close as your telephone. Try us on your next order and you'll see why it pays to deal with Republic Supply!

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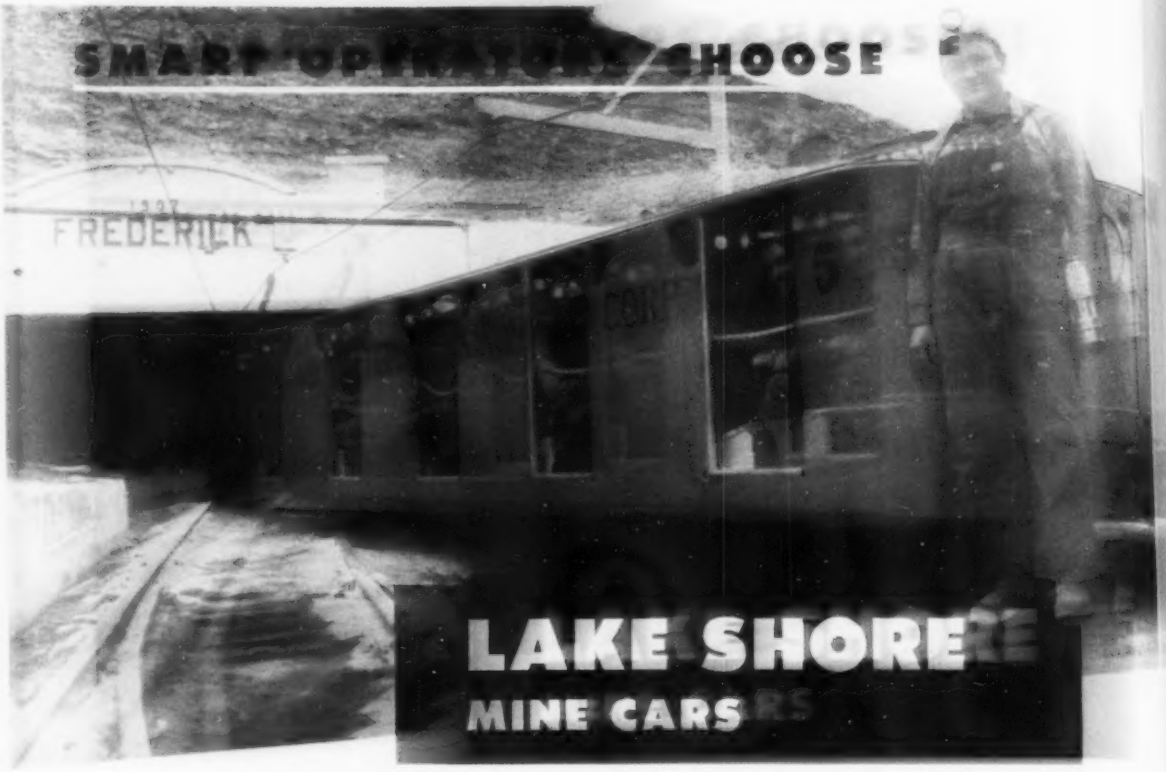
Pipe, valves and fittings • abrasives • shop supplies and tools • rigging materials • mechanical rubber goods • machinery • oil field supplies



for a safe, smooth ride . . .

THAT'S what this Lake Shore Man Haul car (above) gives 30 men . . . a dry, safe, comfortable, upright ride with plenty of knee and headroom — space on the seats for dinner boxes. Enclosed design gives men full protection. Available insulated against electricity. Car equipped with full universal oscillating trucks, or conventional type.

for heavy loads and rough service . . .

250 cubic feet — the capacity of this tough, all-welded Lake Shore Granby type side dump car . . . designed for the extremely hard loading and operating conditions met in modern, high-production mining.

a standard of reliability . . .

This 38 cubic foot Lake Shore Standard side dump car has given years of trouble-free service in mines all over the country. Time-tested, simple, sturdy design.

Write for more information on Lake Shore "Job-proven" Mine Cars and Mine Equipment

Standard and Special
Mining-Milling Machinery for Every Application.

LOHED MINE CARS

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BICYCLE SHEAVES

LAKE SHORE Engineering Company
IRON MOUNTAIN, MICHIGAN

No sickening drill fog with DRILLUBE

In close quarters, thousands of feet down, nauseating drill fog is an expensive work-stopper. You can eliminate this costly problem by using DRILLUBE in all your air drills. For special ingredients in DRILLUBE *prevent* any sickening odor in the unusually slight amount of oil vapor formed.

DRILLUBE has the body, high film strength and emulsifying properties required for steel-against-steel lubrication under wet air conditions.

DRILLUBE feeds uniformly to guarantee constant, thorough lubrication in either hand-oiled or line-lubricated equipment.

Other DRILLUBE advantages: low cold test to counteract refrigerating action of compressed air . . . high flash point to eliminate fire dangers . . . low rate of consumption, making it one of the most economical drill lubricants you can buy.

For full information on DRILLUBE write your nearest Union Oil office.

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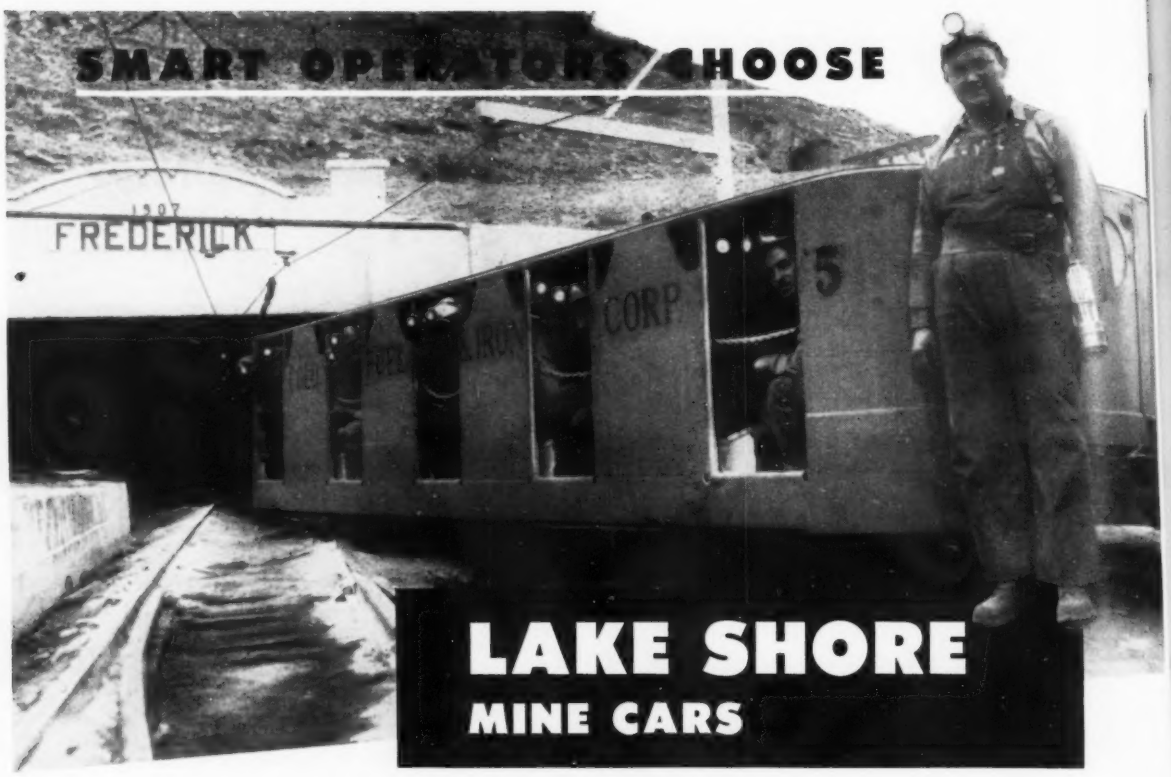
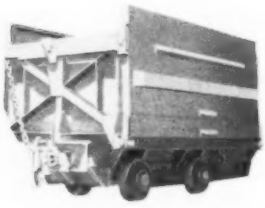


LAKE SHORE
MINE CARS

for a safe, smooth ride . . .

THAT'S what this Lake Shore Man Haul car (above) gives 30 men . . . a dry, safe, comfortable, upright ride with plenty of knee and headroom — space on the seats for dinner boxes. Enclosed design gives men full protection. Available insulated against electricity. Car equipped with full universal oscillating trucks, or conventional type.



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Standard and Special
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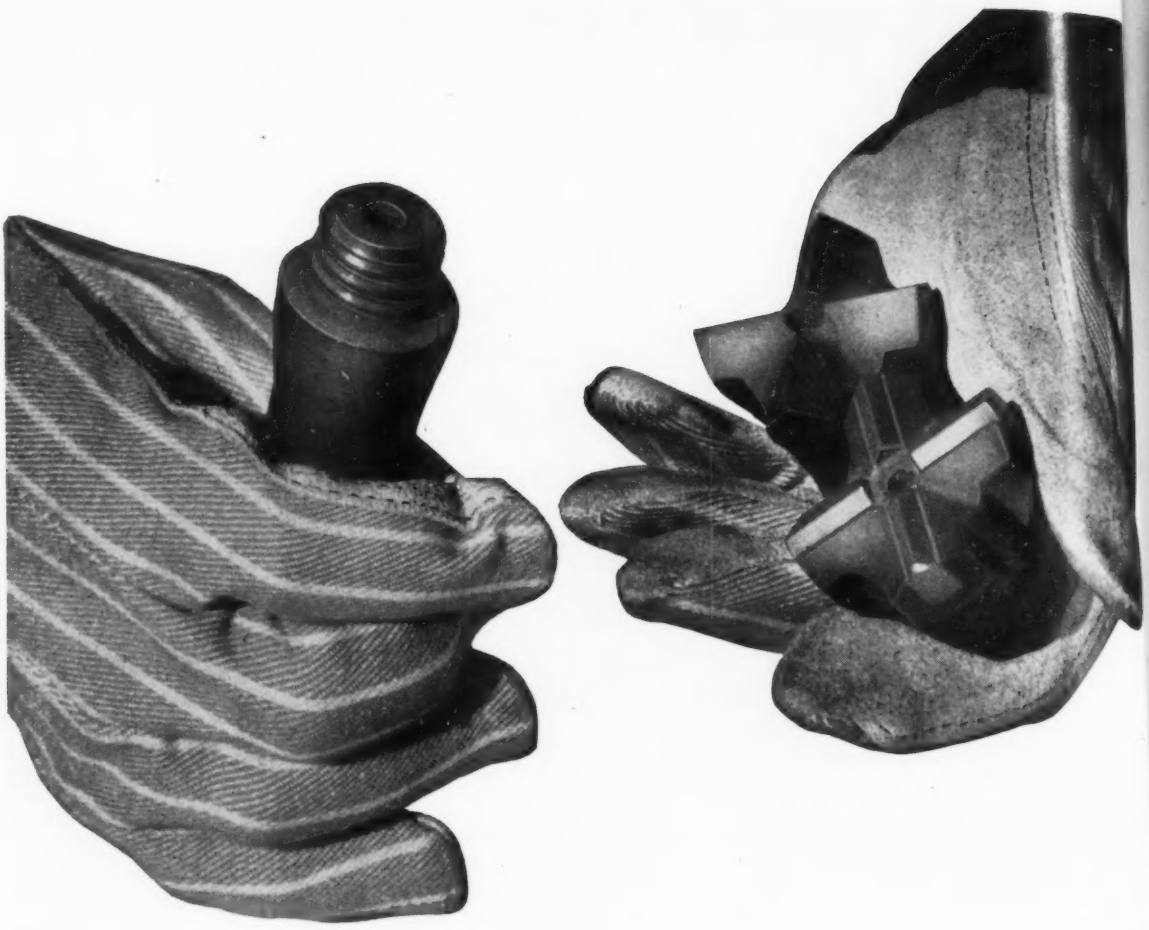


One drill steel does the work of two with TIMKEN® interchangeable rock bits!

ONE drill steel serves two purposes when you use Timken® interchangeable rock bits. That's because both Timken multi-use and Timken carbide insert bits fit the same threaded drill steel! Drillers can quickly switch from one bit type to another as the ground changes—right on the job!

Use Timken multi-use bits for ordinary ground. When correctly controlled and reconditioned, they'll give you the lowest cost per foot of hole when full increments of steel can be drilled.

It's easy to make a quick switch to Timken carbide insert bits when you hit hard or abrasive ground. They're your best bet for maximum speed drilling, small diameter blast holes, very deep holes and constant gage holes.

Timken multi-use bits and Timken carbide insert bits are interchangeable in each thread series. And each type has these three important advantages: (1) made from electric furnace Timken fine alloy steel, (2) threads are not subject to drilling impact because of the special shoulder union developed by the Timken Company, (3) quickly and easily changed.

Call upon the 20-years' experience of our Rock Bit Engineering Service for help in selecting the best bits for *your* job. Write The Timken Roller Bearing Company, Canton 6, Ohio. Cable address: "TIMROSCO"

TIMKEN

TRADE-MARK REG. U.S. PAT. OFF.

your best bet for the best bit
. . . for <u>every</u> job

. . . YET SCRAP INVENTORIES ARE ALARMINGLY LOW. *YOU* ARE BEING COUNTED ON TO HELP KEEP THE FURNACES WORKING . . . TO AID DEFENSE

With our increased steel production, the furnaces are gobbling up an enormous amount of iron and steel scrap.

More—far more—scrap than is at present going into their scrap stockpiles.

Many mills are operating on a hand-to-mouth basis. Some are already threatened with shutdown—for lack of scrap.

The Danger Is Increasing

Will efforts to fill the tremendous demands for steel fail because of lack of scrap?

Steel is made from 50% scrap. We could be severely handicapped—in our aim to keep abreast of both military and civilian requirements—if scrap suppliers can't keep pace with productive capacity.

But they *can* keep pace . . . with your help!

Enough Scrap IS Available!

Yes—the only problem is to get the available extra scrap from where it is—to where it's needed.

Where is it?

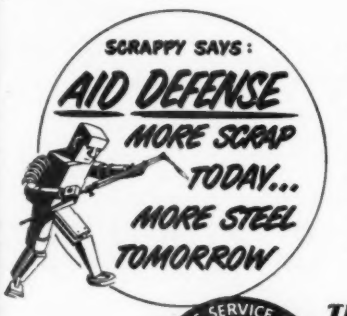
In *your* business . . . in the form of old machines and equipment, tools, implements, dies, jigs, fixtures, outmoded structures, chains, valves, wheels, pulleys—any old iron and steel that's rusting away.

Six Million EXTRA Tons Needed!

By the end of 1952, we'll be producing steel at an annual rate of 20 million tons more than in 1950. That means we will need at least 6 million more tons of scrap than we've ever needed before.

It's up to you. Write at once to Advertising Council, 25 W 45 St., New York 19, N. Y., for a free copy of "Top Management: Your Program For Emergency Scrap Recovery".

Please write today—there's not a day to lose.

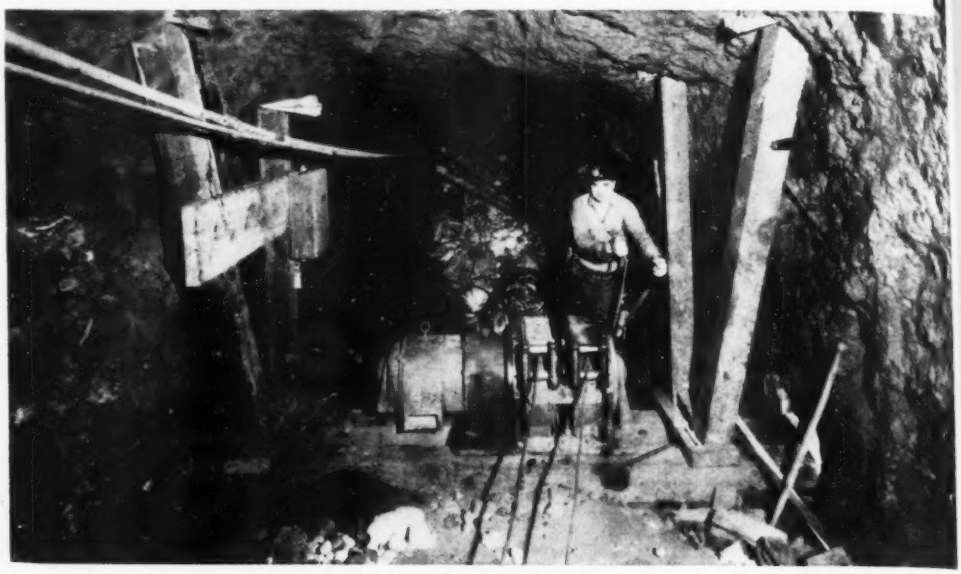


NON-FERROUS SCRAP IS NEEDED, TOO!

This advertisement is a contribution, in the national interest, by

MINING WORLD

PUTTING *MUSCLES* IN A SLUSHER HOIST



Powering a slusher hoist is no job for a "pantywaist" cable.

Rockfalls, water, general mechanical and electrical abuse are normal events in the life of these cables. That's why you will find so many smart operators using Simplex-TIREX portable cables to bring dependable power to their slusher hoist. Simplex-TIREX Cables will operate dependably, even under the most adverse conditions, and they will do it for a surprisingly long time.

All Simplex-TIREX Cables are protected by a special cured-in-lead neoprene armor. This cured-in-lead process assures a smooth and tough outer jacket. The cable will not catch on obstructions. Thus it is easy to pull into place.

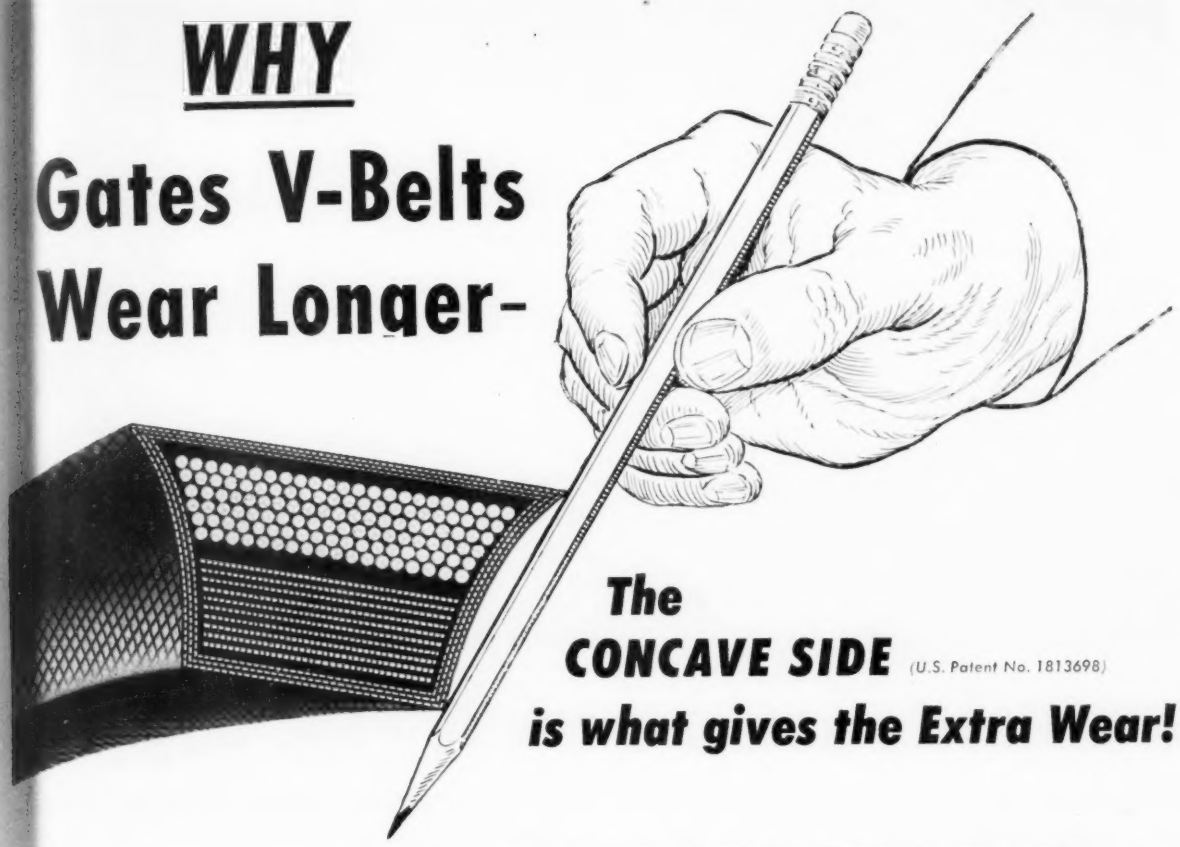
Simplex-TIREX Cables are no newcomer to the mining fields. They were developed for this service. They were the first cable to have a hard service rubber jacket. All other rubber-jacketed cables came after TIREX was developed. If you want dependable ore moving done, equip your slusher hoist with Simplex-TIREX Cable.

Simplex WIRES & CABLES

TIREX CORDS AND CABLES *are made only by the*

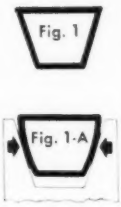
SIMPLEX WIRE & CABLE CO., 79 Sidney Street, Cambridge 39, Massachusetts

WHY
Gates V-Belts Wear Longer-



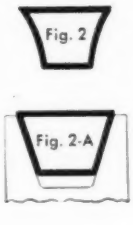
The CONCAVE SIDE (U.S. Patent No. 1813698) is what gives the Extra Wear!

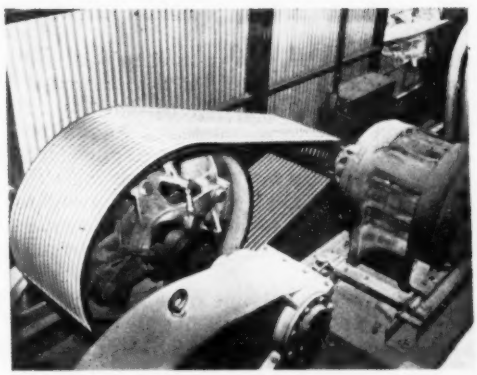
Take any *straight-sided* V-Belt (Fig. 1) and bend it as it bends in going around its pulley. You will clearly see its sides *bulge out* (Fig. 1-A). These sides therefore press *unevenly* against the V-pulley and this causes extra wear at the point shown by arrows (Fig. 1-A).



Now bend a Gates Vulco Rope with CONCAVE SIDES (Fig. 2).

You will see the precisely engineered CONCAVE SIDES fill out to an exact fit in the sheave-groove (Fig. 2-A). The sides press *evenly* against the V-pulley. All wear is distributed *uniformly* across the *full width* of the Gates Vulco Rope—and this means longer belt *life* and *lower* belt *costs* for you.





Typical Gates Vulco Rope Drive—the Gates V-Belts are built with Concave Sides to insure longer belt wear.

When you buy V-Belts, be sure to get the V-Belt with the CONCAVE SIDES—the Gates Vulco Rope!

Gates Engineering Offices and Jobber Stocks are located in all industrial centers of the United States and in 71 foreign countries.

CS-533

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Molded Rubber Goods
for industry
World's Largest Maker
of V-Belts

Gates® VULCO ROPE DRIVES

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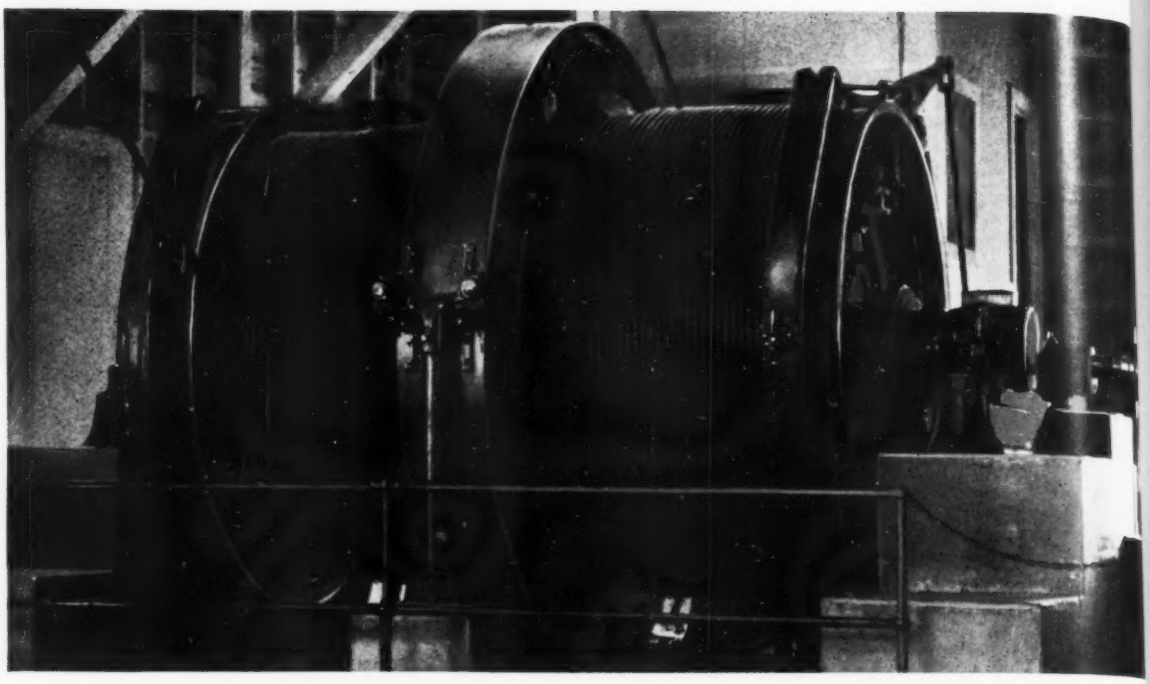


Here's your best wire rope buy—

Mining ropes that are about 15% stronger than Plow Steel *yet cost only 5% more!*

You'll get more for your money every time by using Monitor Steel grade of Tiger Brand Wire Rope in your mining operations. It's stronger, tougher, and more wear-resistant than any other standard grade of wire rope. For example, Tiger Brand Monitor Steel is about 15% stronger than Plow Steel. Yet, for all its superior qualities, Monitor Steel costs only 5% more. And because of these qualities, it is better suited to any mining-rope job you have.

As a shaft- or slope-hoist rope, Monitor Steel is stronger and more resistant to wear and fatigue. These superior properties mean greater safety and more economical operation for you.

As a slusher rope, Monitor Steel saves you money because it extends the intervals between replacements. Monitor Steel's ability to take punishment means less down-time for rope repair and replacement.

In strip mining, Monitor Steel pays off again, for it's made to give you longer, more dependable service on power shovels, dozers, and other rope-using equipment.

Remember that all of these superior qualities are yours at little extra cost. That's why Tiger Brand Monitor Steel is your best wire rope buy. It comes in a type and size to meet every mining application and requirement.

Monitor Steel has no equal for mining-rope applications and is available only in U·S·S American Tiger Brand Wire Rope. For advice on the best type of Tiger Brand Monitor Steel Wire Rope for your mining-rope jobs, you're welcome to the services of a Tiger Brand Field Specialist. Contact your local distributor or write to Columbia-Geneva Steel, 1403 Russ Building, San Francisco 6.

USS

U·S·S TIGER BRAND Wire Rope

Columbia-Geneva Steel Division, United States Steel Corporation, San Francisco
In the East: American Steel & Wire Division, Cleveland, Ohio

UNITED STATES STEEL

—Drifts and Crosscuts—

Preserve Lead and Zinc Industry—The most important development in the lead and zinc industry in the last 20 years was announced at the Colorado Mining Association's convention in Denver on February 12. By unanimous agreement, lead and zinc mining and smelting spokesmen, representing every mining district in the U.S.A., agreed on a program. The National Emergency Committee on Lead and Zinc, headed by Otto Herres, vice president of Combined Metals Reduction Company of Salt Lake City, recommended that in the interest of national defense and security the following constructive legislation is needed without delay for preservation of the domestic lead and zinc industry.

1. Whenever the respective market prices of these metals are below the prices required to perpetuate the domestic mining industry, a sliding scale stabilization import tax on lead and zinc must be provided.

2. The base prices on which the tax should be determined should be prices that will yield domestic market prices of 15½ cents per pound New York for lead, and 14½ cents per pound East St. Louis for zinc.

3. These base prices should be adjusted periodically with the Bureau of Labor Statistics index of primary market prices for all commodities other than farm and food.

4. No tax should be assessed when the domestic market price is equal to or greater than the adjusted base price.

5. In the case of zinc metal and refined lead, the import tax should be at the rate of one cent per pound for each one cent the market price is below the adjusted base price.

6. The same procedure should apply for zinc and lead in ores and concentrates except that the import tax should be seven-tenths cent per pound for lead content and six-tenths cent for zinc content.

7. The legislation should be made effective for not less than the life of the defense act for any extension thereof.

Mining World urges the support of this program by all segments of the zinc and lead mining industry and all people who believe that the domestic mining industry is worth saving in the interest of national security.

Domestic Developments—"Present to Stalin" is the name of the four pitchblende claims now under development in Nevada's Humboldt Range. . . . Nevada Uranium Company is winzing below its adit level to develop the pitchblende-bearing vein. . . . This could be Nevada's first uranium mine. . . . ¶ The Carlsbad, New Mexico potash district continues to be one of the most active mining districts in the United States. . . . Exploration drilling is underway up to 50 miles east of Carlsbad. . . . Latest company to enter the district is American Potash and Chemical Corporation. . . . The company recovers potash from California's Searles lake. . . . ¶ Bunker Hill & Sullivan Mining and Concentrating Company may be in the uranium mining business soon. . . . Geologists for the U. S. Atomic Energy Commission have found uranium in the Hooper adit of the Crescent mine that Bunker Hill is reopening. . . . It adjoins Sunshine Mining Company's ground where uranium was found on the 3,100- and 3,700-foot levels.

Process Developments—The Bolivian Banco Minero continues testing and laboratory investigations in an effort to develop a low-cost method for treating low-grade complex Bolivian tin concentrates in Bolivia. . . . Under study are a hydrogen reduction process developed at the Massachusetts Institute of Technology, a reduction with coal, and a chloridizing process. . . . ¶ The use of ion exchange for uranium recovery in South Africa (MINING WORLD, Dec. 1952, p. 37) is reported to be a success. . . . Look for the process to be incorporated in mills to treat Colorado Plateau ores.

Activity Abroad—Beryl- and tantalite-bearing pegmatites in the Fort Victoria district of Southern Rhodesia are of growing importance as producers of these strategic minerals. . . . Individual pegmatites are reported richer than the well-known Brazilian deposits. . . . United States bonus on tantalite is contributing to pegmatite mining in several parts of Africa. . . . S. Rhodesia recorded 5.18 tons of tantalite concentrate and 0.56 tons of columbite in first 11 months of 1952. . . . None in 1951. . . . ¶ Sheep Creek Gold Mines, Ltd. reports that it has developed a mine at the Mineral King prospect. . . . Values are in lead, zinc, and silver. . . . Located in British Columbia's Windermere district development started in 1951.

Metal Trends—Reports indicate that the United States Atomic Energy Commission is not now buying beryl. . . . It's believed that the Commission has adequate supplies. . . . Industry demand remains good. . . . Price appears steady at $48.00 per short ton unit c. i. f. New York. . . . At long last concentrates appear to offer a beryl source cheaper than the hand-cobbed crystals. . . . ¶ Any one thinking he has germanium in his ore can contact Pennsylvania Coal and Coke Corporation. . . . Don't send samples. . . . Write them first at 30 Pine Street, New York, New York. . . . They will give you detailed instructions about samples.

THE ENGINEER'S REPORT

DATA

LUBRICANT RPM Delo Oils

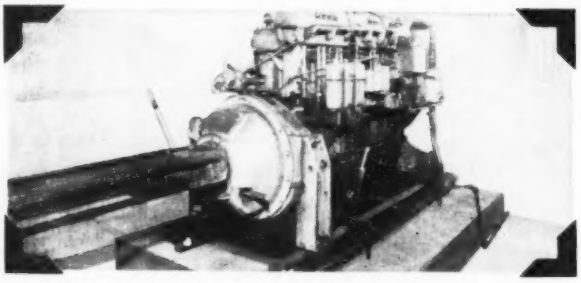
UNIT Caterpillar D13000 diesel

CONDITIONS Constant load

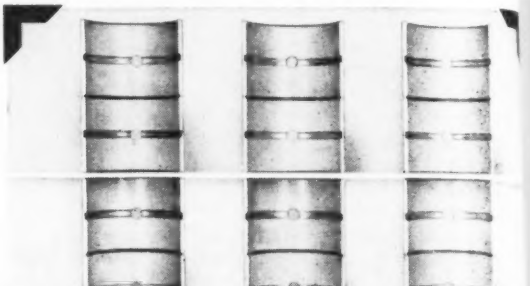
PERIOD 7650 hours

FIRM Dean H. Thayer, Mesa, Ariz.

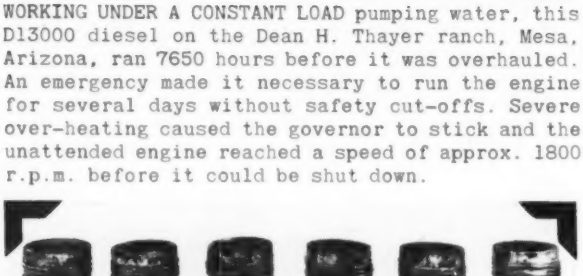
Only 0.001" bearing wear in 7650 hours of work!



WORKING UNDER A CONSTANT LOAD pumping water, this D13000 diesel on the Dean H. Thayer ranch, Mesa, Arizona, ran 7650 hours before it was overhauled. An emergency made it necessary to run the engine for several days without safety cut-offs. Severe over-heating caused the governor to stick and the unattended engine reached a speed of approx. 1800 r.p.m. before it could be shut down.



OPERATED ON RPM DELO Supercharged-2 Lubricating Oil during the 7650 hours, con rod bearings showed only 0.001" greatest wear. There was no pitting and all parts were unusually clean.



NO MEASURABLE WEAR was evident on the pistons which showed original tool marks. Greatest wear on liners was 0.005. Piston rings were all free, oil rings were open. After inspection, main bearings, crankshaft, cam & cam bearings, piston pins and bushings were all put back in service.

REMARKS: This engine operates year 'round in widely varying temperatures. In wintertime, the irrigation water is used to prevent the crops from freezing.

How RPM DELO Oils keep engines clean and prevent wear

A. Contain special additives that provide metal-adhesion qualities...keep oil on parts whether they are hot or cold, running or idle.

B. Anti-oxidant resists deterioration of oil and formation of lacquer...prevents ring-sticking. Detergent keeps parts clean, helps prevent scuffing.

C. Special compounds stop corrosion of any bearing metal, and oil foaming in both wet and dry sump engines.

There is an RPM DELO Oil to meet every heavy-duty engine operation condition. FREE BOOKLET on the RPM DELO Oils gives you complete information. Write or ask for it today.

RPM DELO LUBRICATING OILS

TRADEMARK "RPM DELO" REG. U.S. PAT. OFF.

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CAPITOL CONCENTRATES

COPPER EXCISE TAX EXTENSION BRING SENATORS' COMMENTS

In Senate committee consideration of H.R. 568—the bill to suspend the excise tax on foreign copper for another year—it was brought out forcibly by Senator George W. Malone (Republican, Nevada) and others that endorsement would seem to imply that the present Congress believed a 24-cent price was the proper breaking point below which a 2-cent tariff should be reimposed.

While there was no material objection to a further limited suspension of the tariff, some of the Senators wanted to make it clear that they did not endorse the figure of 24 cents per pound as the breaking point below which the tax would be reimposed, nor did they endorse 2 cents per pound as the correct amount for a tax on foreign metal under present economic conditions.

These Senators realized that the primary objective of the legislation was quick action on a further suspension as the time period on the previous legislation was expiring February 15. The bill had been passed hurriedly by the House of Representatives without consideration of details and was being similarly rushed through the Senate.

Some of the Senators termed it "scandalous" that this country was actually paying a bonus of 10 cents per pound for certain foreign-produced copper. These Senators want the records made clear that there is no implication that the price or the amount of the excise tax specified in the bill represents their thinking as to what either should be; they believe both are far out of line with what they should be under normal economic conditions.

• *Foreign Investments Will Be Pushed*

Rumors from Washington indicate the new Administration will make every effort to funnel private capital into foreign enterprises to save government expenditures. The "Affair Bolivia," where the tin mines and plants were expropriated and the companies presented with a whopping tax bill to more than offset the proposed compensation, has not made for an agreeable atmosphere among investors.

• *Senator Dworshak Speaks Up*

Senator Henry C. Dworshak (Republican, Idaho) always has been the friend of domestic mining. Since his party is in power, however, he has become more vocal and at a recent meeting in Idaho and on the Senate floor he lashed out vigorously against "preferential treatment to foreign mining." Good for the Senator!

• *Tariff Policies Not Yet Revealed*

The rapid passage of the resolution to extend the suspension of the copper excise tax until June 30, 1954, surprised a number of people who expect the Republican administration to lean toward high tariffs. It is not realized generally that the measure, which specifies that the tax be restored if the price of copper falls below 24 cents per pound for 30 days, is a compromise in which the major copper producers have concurred with the fabricating industry. The possible high-tariff trend of the Eisenhower administration is said to worry industrialists in other countries and they are watching the situation with keen interest. When the Reciprocal Trade Treaties Act comes up for renewal the tariff policies of the new Congress and the President will be exposed.

• *Chilean Copper Producers Threatened*

United States companies who produce copper in Chile now have something more to worry about, as the Chilean government does not seem satisfied with its cut in buying their copper at 24½ cents per pound and selling it to the United States at 36½ cents per pound.

Both the Senate and the Chamber of Deputies have approved a plan to give the Government authority to fix the price of copper bought from United States companies operating in Chile. The proposal was passed providing the Executive with extraordinary powers to deal with Chilean inflation and other financial problems. The price-fixing power will be exercised through the Central Bank with the acquiescence of Government representatives on the board of directors.

Chile has been buying copper at a price agreed upon by the Central Bank and the producers and selling it on the world market at a profit. The buying price has been based on the U.S. domestic copper ceiling price of 24½ cents a pound. The selling price has been 35½ cents in Chile, or about 36½ cents delivered to U.S. consumers.

Under the new plan, the producers will have a right to be heard but will have no voice in the final determination of the price. A spokesman for one of the U.S. companies said this amounts to unilateral action by the Chilean government.

Some members of the industry pointed out that there is really little change. In the past the Chilean government consulted with the American companies having mining properties in Chile with respect to the price of copper but in these consultations the Chileans let it be known what price they wanted. While they listened to the advice of the American companies, their own ideas presumably prevailed. Under the new arrangement, there need be no such consultations.

• *Definition Of The Word Is Important*

In his State of the Union message, President Eisenhower made a considerable point of "conservation" of domestic resources. It is to be hoped that members of the "have-not" bloc do not seize on this term and define it to suit themselves as they have in the past. The best sort of conservation is intelligent exploration and production.

• *Congress Has Tremendous Job*

Some idea of the volume of work confronting the Congress, aside from special investigations, may be had by considering the number of bills introduced to date. In the Senate, up to January 31, there had been introduced 730 bills, 34 joint resolutions, 7 concurrent resolutions, and 61 simple resolutions. In the House, the score was 2,445 bills, 160 joint resolutions, 29 concurrent resolutions, and 128 simple resolutions. This makes a total of 3,594 measures on which the Congressional committees are supposed to take some action. It is likely that the

Reagents and Processes for Non-Metallic Minerals

Long a leader in developing and supplying flotation & cyanidation reagents, Cyanamid works constantly to develop new reagents and techniques and to broaden the applications of well-known Cyanamid Reagents.

In the field of non-metallic minerals, considerable progress has been made in the application of new reagent combinations and in using Heavy-Media Separation to beneficiate low-grade feeds.

We invite you to discuss your non-metallic mineral beneficiation problems with Cyanamid Field Engineers who can bring you the benefit of Cyanamid world-wide experience and arrange, where needed, for testing by the Cyanamid Mineral Dressing Laboratory.

Orders for Cyanide, Flotation Reagents and other Metallurgical Chemicals may be placed with American Cyanamid Company, Azusa, California; El Paso, Texas; or c/o Weicker Transfer & Storage Co., Denver, Colorado.

AMERICAN Cyanamid COMPANY

MINERAL DRESSING DIVISION

30 ROCKEFELLER PLAZA, NEW YORK 20, NEW YORK

number will be doubled before the end of the session.

Obviously someone is interested in each of these bills. It is equally clear that only a few can, or perhaps should be given consideration. Only those of real public interest, or those with strong personal or group backing have even the slightest chance of being noticed. The rest will die peacefully with the end of the 83rd Congress.

• *Bender Would Abolish the RFC*

A bill has been introduced by Representative Bender (Republican, Ohio) to abolish the RFC and to transfer such continuing functions as may be necessary to other agencies. According to the present law, if the Reconstruction Finance Corporation goes to liquidation the Treasury will handle it. As far as the small and marginal mines are concerned the RFC became useless when the Act was amended and revised in the 80th Congress, but it is questionable whether the agency should be abolished, as it has extended and now is extending aid to other small businesses which ordinarily cannot get bank loans.

• *Committee Control Passes To New Hands*

The fortunes of elections have precipitated Representative A. L. Miller of Nebraska into the chairmanship of the House Committee on Interior and Insular Affairs. Representative Miller is an M. D. who has taken a great deal of interest in medical legislation for the District of Columbia and, in fact, has been quite active on the District of Columbia Committee. During the last Congress Miller was third ranking Republican on the Interior Committee, but the defeat of Representative Crawford of Michigan and the transfer of Representative Taylor of New York pushed him to the top. Slated for chairman of the subcommittee on mining is Representative Wharton of New York, who comes from a non-mining district. The committee has fired nearly all of its staff including the experts, and apparently intends to start from scratch.

Representative Clair Engle of California, who in the past has been the principal force behind mining hearings, now is with the minority group, and Representative Walter Baring of Nevada, who devoted a large part of his time to mining legislation, no longer is with the Congress.

Mining people will watch with deep concern what this powerful committee does to protect the industry's interests. Right now, conditions do not look too good especially for the small miners, but only time will tell.

COMING CONVENTIONS

March 8 to 12, 1953. Annual convention of the PROSPECTORS AND DEVELOPERS ASSOCIATION, Royal York Hotel, Toronto, Ontario, Canada.

March 23 through 27, 1953. Eighth WESTERN METAL EXPOSITION and WESTERN METAL MINING CONGRESS, Pan-Pacific Auditorium and Statler Hotel, Los Angeles, California.

March 31 through April 2, 1953. FIRST INTERNATIONAL MAGNESIUM EXPOSITION, Washington, D. C.

April 9, 10, and 11, 1953. LEAD INDUSTRIES ASSOCIATION, Silver Anniversary convention, Greenbrier, White Sulphur Springs, West Virginia.

April 27, 28, 1953. Annual meeting AMERICAN ZINC INSTITUTE, INC., Hotel Statler, St. Louis, Missouri.

April and May 1953. FIFTH EMPIRE MINING AND METALLURGICAL CONGRESS. Opening session at Melbourne, Australia April 20, followed by extensive tours.

July 13 to 16, 1953. Fiftieth anniversary meeting IDAHO MINING ASSOCIATION, Sun Valley, Idaho.

INTERNATIONAL PANORAMA

BAGUIO, PHILIPPINE ISLANDS—Itogon Mining Company set a postwar production high during January when gold production was valued at £484,508.82.

BAKER, CALIFORNIA—Mineral Materials Company, a prominent Nevada iron ore producer, is developing an iron ore mine near here with shipments scheduled for Japan.

LA PAZ, BOLIVIA—The Bolivian government has sold the Reconstruction Finance Corporation 5,000 tons of tin concentrate largely produced by Bolivian mines during October, November, December. Nationalization of mines took place on October 31, 1952.

THE DALLES, OREGON—Harvey Machine Company, Inc. has been granted an accelerated amortization certificate for $65,250,000 covering 85 percent of the cost of a new aluminum plant.

SPRUCE PINE, NORTH CAROLINA—The federal government purchased $609,067.69 worth of strategic mica here during the first six months of the mica buying program. The average price paid per pound was $14.95.

PITTSBURGH—Shipment of finished steel products in the 30-day month of November, 1952 were at an alltime high for the United States at 6,647,725 net tons.

AKRON, NEW YORK—The world's first commercial zirconium metal plant is scheduled for initial operation next July. The $2,500,000 plant will produce 150,000 pounds of zirconium and hafnium metals per year for the U. S. Atomic Energy Commission and will be operated by the Carborundum Metals Company, Inc.

KELLOGG, IDAHO—American Smelting and Refining Company is exchanging stock to acquire complete control of its 55-percent-owned subsidiary, Federal Mining and Smelting Company.

SALT LAKE CITY, UTAH—Two of the largest base metal mines with adjoining holdings in the Park City district are merging to form a new company. Silver King Coalition Mines Company and Park-Utah Consolidated Mines Company are the firms involved.

CARLSBAD, NEW MEXICO—The American Potash & Chemical Corporation has started potash exploration drilling 50 miles east of here. The firm is an important California producer.

JOHANNESBURG—Alltime record sales of gem and industrial diamonds in point of value were made in 1952. Sales of South African and other producers through the Central Selling Organization were valued at £69,661,926.

VIENNA—Kyanite is now being mined in the Wipp Valley, Tyrol by the Wipptal Baugesellschaft.

WASHINGTON—The Defense Production Administration has made arrangements for the third loan of aluminum from the Aluminum Company of Canada and the British government. An additional 33,000,000 pounds will be available by the end of March. Repayment of the aluminum must be made in 1954 and 1955.

MANILA—Lepanto Consolidated Mining Company increased production to 377,286 tons of copper-gold ore in 1952. The 1951 production was 358,592 tons.

KELLOGG, IDAHO—The Bunker Hill & Sullivan Mining and Concentrating Company is reopening the Crescent mine, where United States Atomic Energy Commission geologists discovered uranium ore in the Hooper adit.

BELGRADE—A manganese concentration plant is to be built at the Zletovo mine in Macedonia. Completion is scheduled for 1954 with a 24,000 annual ton concentrate production.

TOKYO—Ishihara Chemical Company will build a $6,000,000 titanium dioxide plant in Japan to treat Malayan ilmenite. The Glidden Company (United States) will provide technical assistance for the project.

HENDERSON, NEVADA—Titanium Metals Corporation of America is producing four tons of metallic titanium at its plant here daily. Expansion is underway to bring plant capacity to 10 tons daily.

NEW YORK—Shipments of copper from all mines to United States consumers in 1952 totaled 1,445,764 tons. This compares with 1,517,842 tons during the World War II year of 1945.

PORTLAND, OREGON—The Defense Materials Procurement Agency has signed a contract to purchase 5,000,000 pounds of nickel at 79.39 cents per pound and up to 120,000,000 pounds at 80.5 cents from the Hanna Nickel Smelting Company. Hanna Smelting is newly formed to treat the nickel ores of Nickel Mountain.

BATHURST, NEW BRUNSWICK—Exploratory diamond drilling by the Brunswick Mining and Smelting Company indicates a major zinc-lead-silver deposit amenable to open pit mining here. The No. 12 hole (vertical) recovered 274.5 feet of core assaying 3.77 percent zinc, 1.42 percent lead, and 1.94 ounces silver per ton.

DJAKARTA, INDONESIA—Indonesia was the world's second largest tin producer in 1952. Output was up to 35,003 tons as compared to 30,986 in 1951.

GRAND JUNCTION, COLORADO—During 1952 the U. S. Atomic Energy Commission made uranium ore bonus payments to 165 certified uranium properties.

ANKARA, TURKEY—The Turkish Ministry of Economy is planning to build a steel plant at the seaport of Akcay. Iron ore will be secured from the recently developed deposits near Eskremit.

VERA CRUZ, MEXICO—Gulf Sulphur Corporation has extended its reserve of sulphur on the Isthmus of Tehuantepec. A drill hole showed 130 feet of sulphur mineralization in a total depth of 940 feet.

Big Pb-Zn-Cu Deposit Found In New Brunswick

An important deposit of zinc-lead-silver-pyrite ore has been discovered by the Brunswick Mining and Smelting Company near Bathurst, New Brunswick and an extensive diamond drilling program is now underway.

On the basis of 15 holes drilled to the 200-foot depth, there are an estimated 28,813 tons of lead-zinc ore per vertical foot. Grade indicated by the holes for an average horizontal width of 182 feet and a length of 1,150 feet was 5.20 percent zinc, 1.61 percent lead, and 1.98 ounces of silver per ton. No systematic copper assays have been taken.

Two deeper holes drilled about midway along the 1,100-foot length of the main orebody have not added to previously known dimensions, but do serve as confirmation of ore depth. The entire orebody is contained in almost solid pyrite.

A hole drilled at the north end of the main orebody entered sulphide mineralization at 525 feet and was still in it at 640 feet. The mineralization is chalcopyrite and pyrrhotite, and it is believed that the copper-pyrrhotite represents an altogether different stage of mineralization and possibly indicates the presence of a copper orebody.

The discovery was originally made on the site of the old Bathurst iron mine, and the holdings have since been expanded to include 986 claims both north and south of the original five-and-a-half-acre site. (The whole belt extends for about 25 miles.) Development will probably be by open-pit methods since the overburden is not deep. The company has its own railroad, and power will be furnished by the New Brunswick government.

DMEA Contract To Explore For Uranium In Nevada

A DMEA loan has been granted to the Nevada Uranium Company to explore for uranium on the company's property in Rocky Canyon in the Humboldt Range, Nevada. The government will provide $8,230.50; total cost of the project is estimated at $9,145.

Terms of the contract call for the deepening of a vertical winze from 62 feet to 100 feet below the adit level. From this new level, two crosscuts will be driven for a total of 125 feet. Easterly, a crosscut will be cut 35 to 50 feet; westerly, 56 to 80 feet. The vein will be cut in the process since the winze followed it part of the way down. A tractor and bulldozer will repair and maintain the steep road up the canyon.

The four lode claims have been named "Present to Stalin." President of the firm is Gus Rogers of Winnemucca, Nevada. Ed Bottomley is manager and treasurer; Lena Bottomley is secretary.

Shattuck Denn's Iron King mine, near Prescott, Arizona, has expanded capacity and changed from shrinkage to horizontal cut-and-fill stoping. Shops are housed in the buildings on the left. The low building, leading to the right from the headframe, houses the conveyor that feeds ore directly from the headframe bin to the head of the Iron King mill.

REVISED MINING AT IRON KING

New development and mining methods at Shattuck Denn Mining Corporation's Iron King Branch have made it one of Arizona's biggest zinc producers.

As a part of its program of steady expansion, the lead-zinc producing Iron King Branch of the Shattuck Denn Mining Corporation has increased production and revised its mining methods. It now ranks first in zinc production in Arizona. Formerly (before 1946), ore was extracted at a rate of 450 tons per day largely by shrinkage stoping with haulageways driven in ore. Horizontal-cut-and-fill stopes are now producing up to 700 tons daily and access is provided by laterals carried in the footwall. The Iron King lies between the Agua Fria River, and the Bradshaw Mountains, Arizona's Big Bug mining district 18 miles east of the Prescott.

Mining at the Iron King properties began in 1906 in the oxide zone but was discontinued after World War I. Operations were not resumed until 1936, under the name Iron King Mining Company. In 1942, the Shattuck Denn Mining Corporation bought the property and increased capacity by sinking a new shaft and enlarging the existing mill. H. F. Mills has been in charge of operations since rehabilitation began in 1936 and has directed Iron King's continued expansion. Elmer Tomkinson is the present mine superintendent and A. J. Zinkl the assistant superintendent.

Iron King veins, from 3 to 14 feet wide and 60 to 800 feet long, form a closed echelon system with little or no separation between the individual ore shoots. Because of the contiguity, in plan the cross-section of the mineralized area gives the appearance of a single ore shoot though it is actually made up of distinctly separate veins. Mineraliza-

The Iron King was originally opened by inclined shafts following the dip and spaced along the strike of the formation.

ion is a replacement in schist with only minor—and post-mineral—igneous intrusives evident. Wall rock shows little alteration or impregnation. Some faulting is apparent though no major vein displacements have occurred. Overall attitude of the vein system parallels surrounding schistosity with a strike of N24° and a dip of 75° to the W.

The different veins are similar in both attitude and mineralization, though not necessarily in extent. Each has a rake of about 65° to the north, with a geologic north end marked by a short area of chert and white quartz adjacent to a streak of fine-grained auriferous and argentiferous pyrite. An economic limit marked by a change from ore to non-commercial coarse pyrite, adjacent to the north end of the next vein, determines the southern limit of mining in any particular shoot. Lead, at slightly over 2 percent, is carried as galena evenly over the mineable length of each vein. Zinc (sphalerite), however, varies from a trace at the north end to as high as 10 per cent near the south economic limit and then drops to a trace where the coarse pyrite is met. Gold and silver values, though they occur throughout the vein in pyrite as well as chalcopyrite, arsenapyrite, and tennantite, are carried for the most part in the fine-grained pyrite at the extreme north end of each shoot between the base-metal ore and the terminal white quartz.

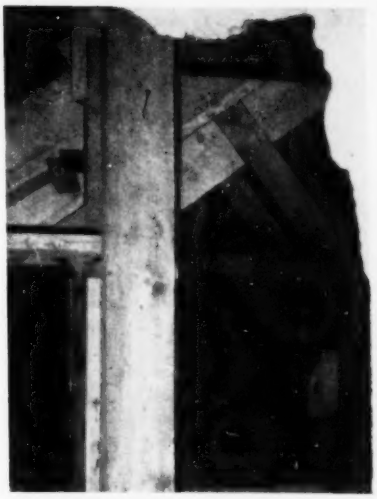
Zoning Lends Flexibility

This zoning of mineralization along each vein allows a wide latitude of selectivity in mining. Precious metals can be mined to the near exclusion of base metal values, or lead and zinc can be mined leaving in place the gold- and silver-bearing either high-grade or low-grade can be mined separately or in combination with the pyritic ore.

When the pyrite at the north ends of the veins is referred to as "fine-grained," the term is used to differentiate the character of these occurrences from the coarser pyrite marking the south economic vein limits. Minerals in the base-metal ores, too, are extremely fine grained and closely interlocked—especially the sphalerite and pyrite—to the extent that the ore is hard and tough with enough silica to make it highly abrasive. Drilling, breaking, and milling are difficult for this reason.

The oxide zone, once actively mined for fluxing ore, extends down from the surface about 200 feet to a sharp sulfide contact. Except for the absence of zinc, oxide values are similar to those of the lower sulfide ore.

Mining areas have been opened by six shafts—four inclines, now abandoned, following the dip of the structure; a vertical shaft, the no. 6, that is the present main hoisting shaft; and a new vertical shaft, the no. 7. Both the no. 6 and the no. 7 (see *Mining World*, August 1952) are on the hanging wall side of the structure and are being deepened to develop lower ore levels. The no. 6 is down 1,780 feet with the lowest development on the 17th level. The no. 7 is being deepened largely by raising from workings extended from the no. 6, advanced ahead of the no. 7 for this purpose. When the no. 7 has reached 1,870 feet, connections on haulage levels between it and the no. 6 will be completed to provide separate hoisting (no. 7) and service (no. 6) shafts. Though initial development will probably not be lower than the 17th level, hoisting facilities will provide for much deeper mining since exploratory underground drilling indicates that mineralization extends below this horizon with no apparent attenuation in either grade or extent.



Chutes to which the ore is slushed from the cut-and-fill stopes lead to short crosscuts between the vein and the footwall haulageways.

Level development is now proceeding on the 1400 and 1500, but no stopes have been started on these levels. On the two levels above, the 1200 and the 1300, development is continuing and stoping has started though no stopes have been completed. The bulk of present production comes from stopes on the levels between the 500 and 1200; ore blocks above the 500 have been mined out.

New Methods for Efficiency

Originally, level development at 100-foot vertical intervals, consisted of drifts following the veins from the inclined shafts. When the vertical no. 6 was sunk, these development drifts extended from crosscuts driven from the shaft to the vein. At the point where two adjacent veins met, a slight (from 2 to 10 feet) offset was required to keep the drifts in ore, forming irregularities in the haulage ways. For this reason and, more importantly, because haulageways were difficult to keep open in the vein, lateral haulageways were driven in the hanging wall. Below the 800, these, too, became difficult and expensive to keep open and the laterals were driven instead in the footwall on the lower levels. Where

Though little timbering is required at the Iron King, where fault zones are encountered, 6-inch H-beam booms and permanent drift sets are used in driving both haulageways and drifts.

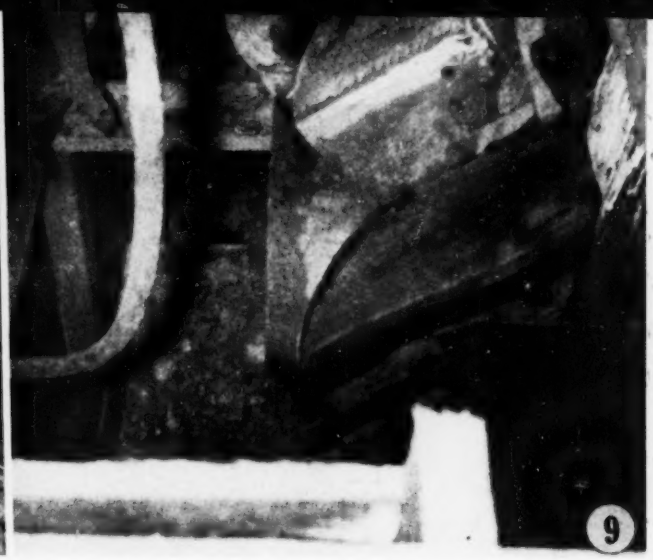
(1) Elmer Tomkinson, at the left, has direct supervision of the Iron King mining method that is used in either wide or (2) narrow stopes.

(3) The first step in stoping is enlarging the development drift to the full width of the vein and high enough to provide for two chute sets.

HOW TO CUT-AND-FILL BY

Because chutes were continually blocked by slabby ore, Shattuck Denn Mining Corporation's Iron King Branch at Humboldt, Arizona, developed its own cut-and-fill mining method to replace shrinkage stopes. Now, all slabs are broken in the stope and, by the use of slushers, a single ore chute replaces the five required in an equivalent shrinkage stope. A raise at the end of the stope opposite the ore chute supplies fill. When the

(4) Chute and manway sets and a bulkhead are then placed at the ore-pass end of the stope; (5) a mat of lagging is laid to protect lower workings when they hole through; (6) fill is slushed in on the mat from the fill raise to (7) within working height of the back, and temporary flooring is stacked in the stope ready for use.



(8) After the gob has been levelled, the temporary flooring is laid, the stope round of vertical holes is drilled and blasted. The broken ore is moved with this Pacific slusher to (9) the chute and into the cars in the short crosscut to the haulageway. (10) Eight-car strings are moved with Mancha locomotives to an ore pass feeding the shaft pocket.

BY IRON KING METHOD

changeover to cut-and-fill stoping was made, a block of hanging wall rock was undercut and caved to form a permanent fill supply. The draw point under the block is connected by fill passes to the lower levels. Fill is trammed from the pass on each level to the fill raises that feed the stopes below that level. Haulageways are carried in the footwall where the hard, tough, country rock requires no timber.

) Fill is provided by material from a cav- block in the hanging wall controlled ugh this single draw point. (12) Over- size is blasted on the grizzly.

(13) The caving block has now worked its way through both the hanging wall schist and the caliche that caps it to form this subsided area at the surface.

Iron King's compressed air supply is generated by the two Sullivan compressors on the left. Iron King's excellent natural ventilation is supplemented by this single blower installation (right) at the No. 6 shaft.

haulageways are in either the footwall or hanging wall, paralleling drifts are still driven for stope development but no longer require the critical maintenance formerly demanded.

The drifts beneath shrinkage stopes carried chutes at 10-foot intervals to draw the broken ore as required. Stope access was afforded by cribbed manways carried up with the stoping at 50-foot intervals. One of the problems never successfully solved in shrinkage stoping was the tendency that the ore has to break in slabs which blocked the chutes and required blasting. Blasting in the chutes often damaged them and, at best, was a difficult, time-consuming task that often stopped haulage and therefore production from adjacent stopes. This problem was especially serious in the old drift-haulage system.

Mining Is Revised

Two features of the Iron King deposit had originally dictated the use of shrinkage stoping. The first was the sharp walls to which the ore broke with little or no dilution, and the second was the strength of the walls and their stability during active stoping. And of course, shrinkage methods offer the advantage of full gravity transfer of ore to the haulage level and the saving in expensive filling during active stoping. These advantages, however, were outweighed by the troublesome hung chutes that continually plagued operations.

Horizontal cut-and-fill stoping was tried, and, found successful, has now replaced completely the shrinkage methods once used. It should be added here that a third method—square-setting — replaces others when the stope nears completion. In other words, when metal prices warrant the expense involved in square-setting, stopes are holed through to the level above by this method, insuring the protection of higher workings. When metal prices are down, or if, for other reasons, it is not desired to hole a stope through to the upper level, the top 20-foot section of ore is left as a level pillar to be mined later.

By the method now used at the Iron King, level development consists of (1) a haulageway driven in the footwall the full length of the structure, (2) a drift following the ore (and therefore offset where necessary between adjacent veins) and driven in advance of stoping as required, and (3) raises at 100-foot intervals connecting the drifts on two adjacent levels to pass the fill used during stoping. At a point midway between the fill raises, a cross-cut connects the drift and haulageway on each level. The present level interval is 100 feet, but, if chutes can be made to last the life of larger stopes, this distance will be increased to 200 feet to reduce the per-ton cost of development. Haulageways in the foot wall stand well without timbering and even drifts require support only when fault zones are penetrated. Where these fault zones are met, hanger sets formed with 6-inch steel H-beam booms are used in driving both drifts and haulageways and permanent drift sets are placed for support.

Stope Development

In stoping, the drift is first widened to the full width of the vein and bulkheads are placed at the ends of the stoping area. A mat of 3- by 12-inch lagging is laid on the floor of the stope to protect lower workings when holing through below and fill is slushed into the stope to within working distance of the back. Before blasting the next round, a temporary slushing floor of 3- by 12-inch lagging is laid on the gob. The round is then drilled and blasted, the broken ore is slushed from the stope, the flooring is removed and stacked aside, fill is slushed in, and the cycle is repeated.

Above the cross-cut connecting the drift and haulageway a manway and ore chute, over which the slusher hoist is blocked into place, are carried up with the stope. These are formed with 10- by 10-inch timber sets and 5- by 10-inch cribbing protected by 3- by 12-inch lagging carrying angle iron on the upper inside edge. This timber is Douglas fir from the Pacific Northwest, as are the shaft timbers and occasional drift sets required where fault zones are encountered. The only other timber used in any quantity is the native timber used in square set stoping.

The Bit's The Thing

The most troublesome mining problem has been drilling through the hard and abrasive Iron King formation—both ore and country rock. Conventional forged steels, originally used, were replaced with detachable bits. These in turn, were replaced by Ingersoll-Rand's Carset insert bits when they were first introduced. In fact, the Iron King was one of the first mines in the United States to switch entirely to the use of tungsten carbide bits.

At the start of the shift, each drill crew is checked out with a complete set of the five changes of bits used. Each bit is numbered, and, at the end of the shift, the footage drilled is recorded by the bit number. From these records, the average bit life between sharpening is shown to vary from 35 to 50 feet, depending on the ground drilled. Bits are

reconditioned in the well-equipped Iron King machine shops by sharpening and grinding to the next smallest gauge size.

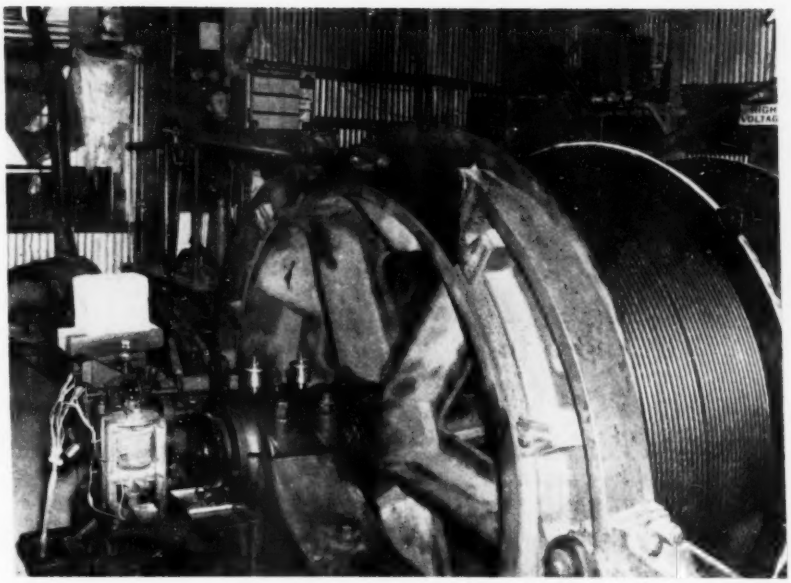
Plans of weakness in the ore result in slabs which were once broken in the chutes but are now drilled by jackhammers (Ingersoll-Rand and Sullivan) and broken in the stopes. Stope rounds, drilled with Ingersoll-Rand and Gardner-Denver stopers, are loaded with 40 percent Gelamite and pull about 6 feet per round.

The 6- by 8-foot drift and haulageway rounds, drilled with Ingersoll-Rand and Gardner-Denver drifters and loaded with 40 percent Gelamite, require from 26 to 30 holes, depending on the rock, and pull from 5 to 6 feet per round.

Fill Produced By Caving

When cut-and-fill mining was begun, little or no development waste was available since the bulk of development was in ore. In the first stopes, short raises were driven into the hanging wall to provide fill in the stopes. When the change to cut-and-fill stoping was made, a 100- by 100-foot block of country rock in the hanging wall was undercut 14 feet above the 600 level and caved to form a permanent fill supply. Waste passes were connected below the 600 to minimize the amount of mechanical transferring. Fill is now provided by tramming from the waste pass on the level above each stope to the fill raise that supplies the stope. At the point on the 600 where the caved material is drawn, a grizzly stops oversize and prevents the passes below from being hung up. A two-man crew bulldozes oversize on the grizzly and breaks arches that form over the draw point.

The extreme weight generated over the single draw point has continually caused trouble in holding the draw open. The problem now seems to be solved, however, with a massive 12-inch steel beam made in the Iron King's shops from $\frac{3}{4}$-inch plate. In cross-section the beam has the appearance of a boxed cross of steel webbing, reinforced at the corners with additional wear-plates. Solid cribs of 10- by 10-inch timber support the ends of the beam, and the back of the drift over the grizzly is protected by 6-inch H-beams laid skin to skin. Where other means of draw point support had lasted a matter of weeks, the new structure has shown no troublesome deformation over the months it has been in use.



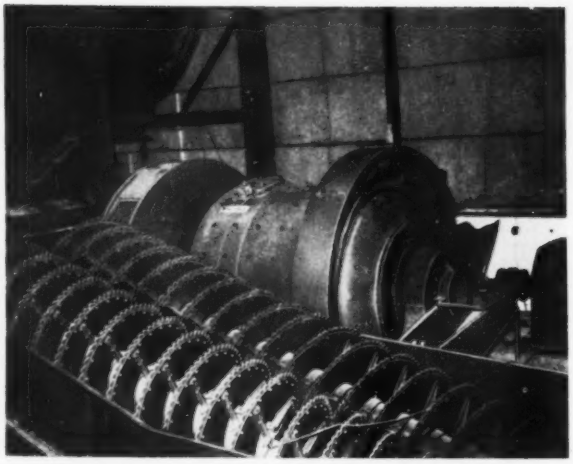
This 100-hp., Lilly-controlled, Ottumwa hoist services the no. 6 shaft, now used for both service and ore hoisting. A new shaft, the no. 7, is being sunk and will be used for hoisting, leaving the no. 6 for service.

Cost Sheets Approve Methods

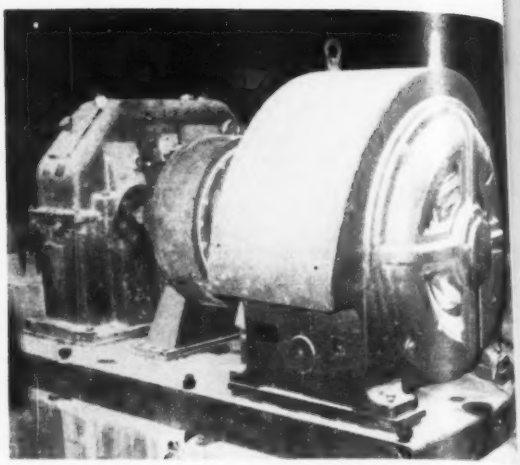
The caved area has now holed through to the surface and both schist and the overlying surface caliche are coming through at the draw point. This method of providing fill has proved extremely successful and the cost of laying fill in the stope has been reduced to $0.48 per ton, including original development of the undercut, maintenance at the draw point, tramming, and slushing in the stope.

In 1944 the total cost of mining Iron King ore was $4.60. With the present mining method, even though the cost of labor and supplies has nearly doubled, per ton costs based on the current production of roughly 650 tons per day have risen to only $6.75. When the new no. 7 shaft is completed, production rate will be increased and effective mining costs are expected to decrease even further.

Mancha trammers are used in tramming both ore and fill at the Iron King. Battery stands and chargers, such as this set, are provided on each haul level.



Barvue's grinding-classification team: One of four Hardinge Triclone ball mills in closed circuit with four Akins Duplex classifiers. The classifiers have serrated blades—a provision to assure good operating characteristics in the sand zone.



This unusual drive system is for a Triclone mill. Left to right: Horton gear reduction unit; Vulcan-Sinclair fluid coupling; English Electric 600-hp. squirrel-cage induction motor. The fluid coupling makes possible the use of a squirrel-cage motor.

quebec

BARVUE MINES LTD.

In less than a year this company transformed a mudflat into Canada's largest and most modern open-pit mine and mill with a daily output of 4,000 tons of zinc ore from proven reserves totalling 18,000,000 tons.

Less than a year ago, the Barvue property was a mudflat. Today, it's a mine—not just an ordinary mine either: At 4,000 tons per day, Barvue is the largest initial nonferrous mining and milling plant ever built in Canada. And it's one of the finest ever built anywhere in the world.

Perhaps the most astounding thing about Barvue Mines Ltd. was the fact that it took management less than two years to develop it from raw prospect to going operation. Here's the timetable:

October 1950. The level clay-covered plain at Barvue was still a raw zinc prospect. It had been trenched, and the trenching indicated that it was worth the expense of a drill hole. Barvue was getting ready to drill.

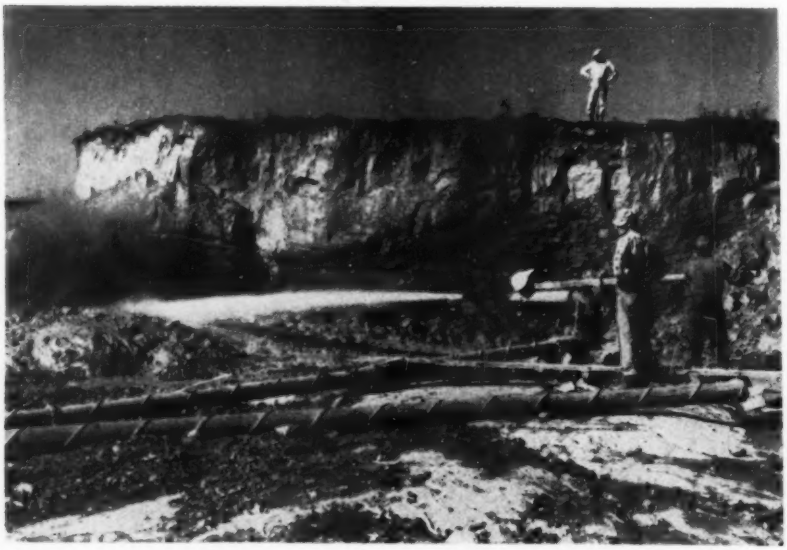
Mid-1951. In a few months, the orebody had been delimited, drilled out to a depth of 700 feet. It measured about 2,500 feet in strike length, 102 feet in true width. It dipped to the northeast at 70°, and down to 700 feet contained 18,000,000 tons of ore averaging 3.3 percent zinc and 1.2 ounces of silver per ton.

June 1951. Barvue negotiated a firm contract for sale of 175,000 tons of zinc concentrate. The contract was based on a 17.5¢ (U.S.) price for zinc metal. This contract gave Barvue management the firm financial base it needed. The company started planning for a 4,000-ton-per-day mine and mill.

Late 1951. Plans were well under way.

November 1951. Stripping contractor started hydraulically stripping

Jet water is used for hydraulic stripping of the clay overburden. The monitor operator undercuts the bank. The 6-inch, high-pressure jet water line is flexibly coupled to facilitate quick moving of the monitors.



overburden from the orebody. *January 1952.* Workmen poured first concrete at the millsite. *October 1952.* The mill began to process ore from Barvue's open pit.

New Techniques

This record of speed speaks for itself. In addition, Barvue is noteworthy for its use of new construction and development techniques, new equipment; many of these were in turn responsible for the speed:

Clay overburden covering the pit area is being removed by hydraulic stripping. The cost per yard: about one-fifth that for truck and shovel.

Open-pit zinc mines are rare. But with a wide, steeply dipping, vein-like structure, Barvue chose to mine by pitting.

All drilling in the pit is being done dry—by an Ingersoll-Rand Quarrymaster. In sub-zero Barraute, elimination of water is important.

External conveyor housings are built in the form of a large self-supporting tube. They were prefabricated, shipped to the site, erected in a matter of hours.

The fine-ore bin is an unusual type called a "catenary" bin. It is an all-welded, tensional structure, suspended from posts at the side.

The mill building is serviced on all levels by a push-button freight elevator big enough to carry a loaded lift truck. That virtually eliminates manhandling of equipment and supplies. Reagents, for instance, go to the top floor, are mixed, flow by gravity to distribution tanks, and then flow by gravity to the point of feed.

All buildings are accessible through a network of underground tunnels. In these tunnels, water lines are kept from freezing, and all utilities are easy to work on or repair.

Ball mills have a fluid coupling between the cage-wound induction motor and the gear-reduction unit. The advantages: smooth, jerk-free starts, and allowance for a 10 percent speed regulation.

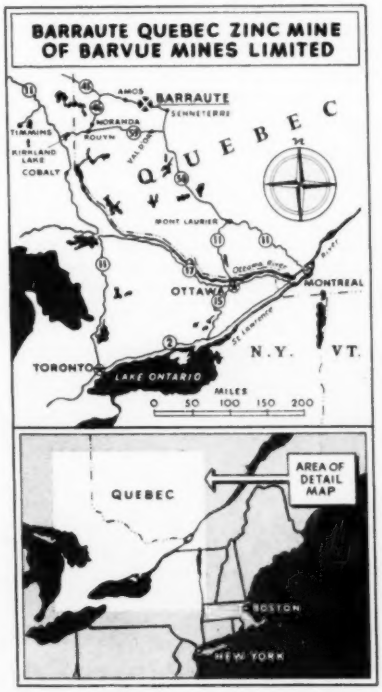
All pumps in the mill are Linatex—lined with rubber that is applied and bonded directly to the metal.

Discovery

Now, let's see how Barvue Mines Ltd. came into being. Dr. W. W. Weber, of the Quebec Department of Mines, was largely responsible for discovering the Barvue orebody. He noted that a small outcrop near the center of the present pit contained zinc mineralization that would warrant prospecting. He passed the word along.

The LeClerc brothers, owners of the claim, took him up on his advice. They trenched the outcrop and did a little other surface prospecting, but the zinc showings were low in grade and were covered with a thick, flat mantle of clay.

This artist's sketch shows the compact arrangement of the Barvue buildings with the continuous ore flow from the pit through the crushing plant into the mill with the concentrate from the mill conveyed to the filtering plant and loaded into railroad cars in the lower right foreground.



The LeClercs optioned the property to New Goldvue Mines Ltd. Golden Manitou Mines, Ltd., in turn bought the property from New Goldvue under commitment to spend a minimum of $100,000 on exploration, and then formed Barvue Mines Ltd.

With the thick clay covering, diamond drilling was the logical method for exploration. Barvue's first drill hole collared in ore. Crews then put down 54 successive inclined holes before they hit a weak one. Most of them were in a line strikewise, spaced 50 feet apart.

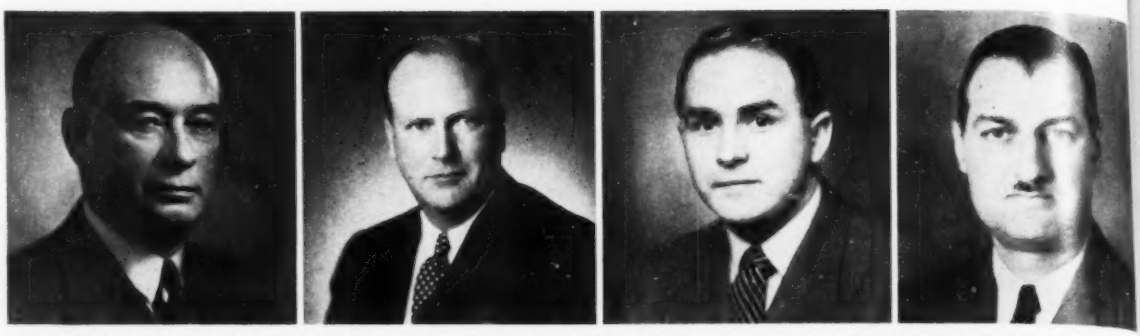
And Decision

Barvue had an orebody—18,000,000 tons to 700 feet of depth. It was big (102 feet true thickness and 2,500 feet long). It held a strong promise below 700 feet (bottomed at full size). But it was low in grade. Barvue officials figured that at the predictable average price for zinc, they could make a profit. They drew up tentative plans for the 4,000-ton-per-day operation.

The American Zinc Company signed a firm contract with Barvue for the first 175,000 tons of zinc concentrate. The contract calls for payment based on 17.5¢ per pound of zinc and payment for silver contained in the concentrate. That provided Barvue with a market for roughly 2½ years of production. In the contract, there is also an option for renewal.

Under the arrangement, some of the concentrate goes by rail to the Aluminum Company of Canada at Arvida, Quebec. There, a fluo-solid (Dorrco) roast removes the sulphur (and the sulphur dioxide is used for

THESE ARE THE MEN BEHIND BARVUE



Left to Right: H. W. KNIGHT, president of Barvue Mines Limited and Golden Manitou Mines Limited; ANDREW ROBERTSON, vice president and general manager of Barvue Mines Limited and Golden Manitou Mines Limited; W. W. WEBER, staff geologist for Barvue Mines Limited, and M. D. ISBISTER, manager of Barvue Mines, Limited.

manufacture of sulphuric acid). Roasted concentrate is shipped to American Zinc, Lead & Smelting Company. Some concentrate is shipped directly to the United States Steel Company at Donora, Pennsylvania, and some to American Zinc Company at Fairmont, Illinois.

Strip Hydraulically

Zinc ore is in a rhyolite breccia. The ore formation is strongly sheared by a drag fold which geologists think caused the big widths of ore. The fault was probably in tension too (it is about 35° off the regional strike).

The orebody strikes west-northwest (in a flat arc) and dips about 70° to the northeast.

Clay covered the orebody and the rock of the hanging wall to an average depth of 15 to 18 feet. The first mining job was stripping this clay.

Management decided on hydraulic mining methods and had the necessary pipe and pumping equipment on the ground by November 1951. Bert Thomas was put in charge on a bonus contract and is removing the clay for about 35¢ per yard; stripping with truck and shovel would cost an estimated $2.25 per yard.

On Barvue's flat terrain, the hydraulic stripping rig consists of these elements:

Fresh-water supply is the nearby LaFlamme River. There, a Diesel-powered centrifugal pump sends water at low pressure to a dam near Barvue's millsite. Purpose of this intermediate dam is to cut down the length of high-pressure line.

At the dam, a two-stage GM Diesel-powered centrifugal pump sends water through two 10-inch high pressure lines to the monitors. The pit end of this line is arranged with swivel joints so that monitors can be moved quickly.

Each 6-inch monitor (three in use now) is equipped with a two-inch nozzle, jets water at 125 pounds per square inch, and uses about 12[illegible] gallons per minute of water.

The jet water cuts overburde[illegible] easily, and then, draining to a na[illegible]ural sump, carries 25 to 35 perce[illegible] solids.

At this natural sump, which [illegible] shifted occasionally to follow [illegible] monitors, a 12-inch centrifugal sa[illegible] pump picks up the clay-water slur[illegible]

The discharge leaves by a 16-in[illegible] low-pressure line (treated wo[illegible] wrapped with wire) and goes to Ba[illegible]vue's tailing pond in a near[illegible] swamp.

Bert Thomas started in Novembe[illegible] 1951. He stripped through 1952, an[illegible] will finish the job in 1953. By th[illegible] time, he will have removed abo[illegible] 1,000,000 yards of overburden. An[illegible] the entire pit will be bare down t[illegible] hardrock.

And Truck Pit the Ore

Barvue's mill is on the footwa[illegible] side of the orebody. The entry roa[illegible] into the pit is on the footwall sid[illegible] opposite the mill.

The open-pit mine is still in its i[illegible]fancy. Near the surface, removal o[illegible] a little waste releases a lot of or[illegible] The footwall slopes in at 70°, and th[illegible] pit slopes in at 60°; so there is onl[illegible] a small wedge of waste to be re[illegible]moved there.

Benches are being established at [illegible] regular interval of 30 feet. Workin[illegible] the mine now requires this equip[illegible]ment:

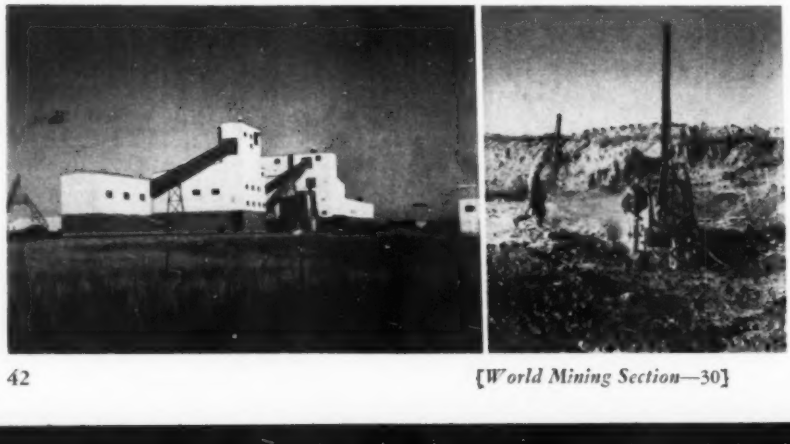
One Ingersoll-Rand Quarry[illegible]master, 6-inch "X" Carset bit[illegible] steel.

Two Link-Belt, 2½-yar[illegible] Speeder shovels, both powere[illegible] by Caterpillar D-17,000 Diesel[illegible]

Five Euclid, Model TD, 22-to[illegible] rear-dump trucks. All powered by Cummins, 195-hp. 6NHBI[illegible] supercharged Diesels.

Holes are currently spaced abo[illegible]

LEFT: Barvue's new mill rises high above the flat plain northwest of Barraute, Quebec. The new 4.2-mile branch of the Canadian National Railroad runs along this (fine crushing and milling) side of the mill site. RIGHT: Light blast holes and trimming jobs fall to these Joy wagon drills. Each carries a TM-40 drifter, and uses 10- and 20-foot lengths of steel, tipped with 2-inch Craig integral carbide cutting inserts.



16 feet apart, loaded with 5-inch cylinders of 40 percent Forcite blasting powder, and detonated with Primacord. Incidentally, Barvue started the pit with vertical holes, heavily loaded, rather than using a wedge-cut round. The breakage was blocky, required a lot of secondary blasting, but gave the mine a quick start.

Standard Metallurgy

The mill was designed by General Engineering Company (GECO), of Toronto, Ontario, in conjunction with Barvue's own consulting metallurgist, D. Livingstone. A guiding factor in both design and construction was the short season of west-central Quebec. It led to such features as indoor storage of ore, the underground utility-and-access tunnel, use of prefabricated steel conveyorways.

Purpose of the mill is to produce a 60 percent (or higher grade) zinc concentrate. To do that requires a highly selective float—one which rejects pyrite and arsenopyrite. At some later date, Barvue will complete a circuit for pyrite recovery; the mill building has space set aside for this circuit; but as Mr. Livingstone says, "the pyrite circuit can wait until we've solved all problems in the zinc circuit."

The flowsheet (see cut) is exceptionally simple, and reagent requirements as shown in Table No. 1 are unusually low.

Close reagent and alkalinity control are required to produce a concentrate of 60 percent or better. Flotation operators are guided in this control by assays for zinc and iron taken at key points in the circuit every four hours or so. When the proper control points have been determined, Barvue may go to automatic pH and density control.

In the roughers, pH is held at about 11.5. In the cleaners, it is stepped up to 12.0.

Rougher flotation takes place in four parallel banks of 48-inch Agitairs. Each pair of banks works with a bank of No. 24 Denver "Sub-A" cleaners.

Zinc roughing is done in three stages (rougher, middling, scavenger) followed by three-stage cleaning.

Tubes and Catenaries

So much for the metallurgy. Let's take another look at features of plant design and construction.

Prefabrication accounted for much of the construction speed. Smaller buildings were prefabricated in England. Large buildings and major units of the plant were prefabricated by the Central Bridge Company at its plant in Trenton, Ontario.

The conveyorways are a typical example. They are 10-feet in diameter, prefabricated from ¼-inch plate. In effect, they are a huge pipe strong enough to be self-supporting (except for long runs where support towers are required).

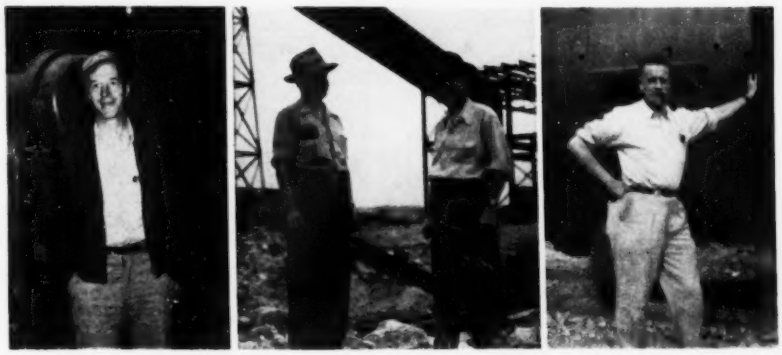
Sections of conveyorway were shipped to Barraute, already flanged on the ends and ready for erection. At Barraute, they were erected, bolted into position, in a few hours.

The conveyor systems were also prefabricated in matching units. They were fitted easily into the conveyorways and erected just as quickly. P. D. P. Hamilton, vice president of GECO (which specified the tubular conveyorways), says "their installed cost is about the same as for conventional units. But we believe the tubular unit is superior in almost every respect."

The 8,000-ton catenary orebin is the fine-ore bin (just prior to grinding). It's a suspended tensional structure, as contrasted with the usual massive compressional ore-bin. Its construction allows it to be entirely inside the mill building, with warm air next to the outside walls. With 24 draw points along the bottom, it allows for almost complete drawoff.

The catenary bin was built at the

THESE MEN KEEP BARVUE RUNNING:



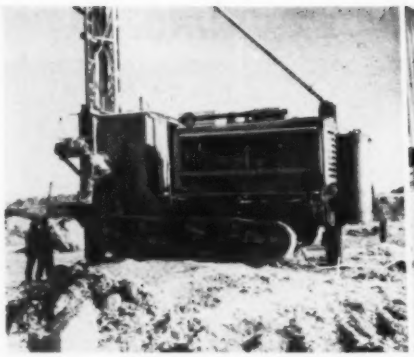
Left to Right: A. ALMSTROM, mill superintendent; D. LIVINGSTON (left) Barvue's and Golden Manitou's staff metallurgist, talks to P. D. P. HAMILTON, vice president of General Engineering Company, Ltd.; HANK AIREY, metallurgist for General Engineering Company, Ltd.

Left: PAUL PIQUETTE, hydraulic stripping foreman (left) and BERT THOMAS, stripping superintendent, are in charge of removing about 1,000,000 cubic yards of overburden in two full seasons. Right: W. L. "BILL" BURNETT, master mechanic, is in charge of the new machine-and repair ship. If a part can't be repaired or bought, he makes one.

Table No. 1

Barvue Reagents, Pounds Per Ton Consumption, Points of Addition, and Uses

Reagent	*Consumption*	*Points of Addition*	*Use*
Hydrated lime	2.5 to 3.0	Ball mills, and cleaner cells	Regulate pH depress pyrite
Copper sulphate	0.3 to 0.4	Zinc conditioners	Activate sphalerite
Sodium "Aerofloat"	0.03	Stage fed to rougher circuit	Sphalerite promoter
Methyl Isobutyl Carbinol	0.03	Rougher cells	Frother



LEFT: This Ingersoll-Rand Quarrymaster is the big drilling unit in the Barvue open pit. In the medium-soft rock it drills 25 feet of 6-inch h per hour. CENTER: Barvue uses Euclid 14.5-yard, 22-ton trucks in the pit. RIGHT: Breaking in a new operator on one of B Link-Belt Speeders. Most of the operatc

Barvue site by Toronto Iron Wor Ltd., and is of all-welded constru tion. Roughly 25 miles of weldi went into it.

Above the catenary orebin, a trav eling tripper conveyor distribut ore in the bin.

Trippers and Tunnels

The tripper conveyor is also ar ranged so that it can discharge to separate crushed-rock (waste) bi That arrangement provides minus ½-inch waste for use as road mate rial; and with its open-pit mine, Bar vue needs large quantities. The sys tem works like this: Trucks brin

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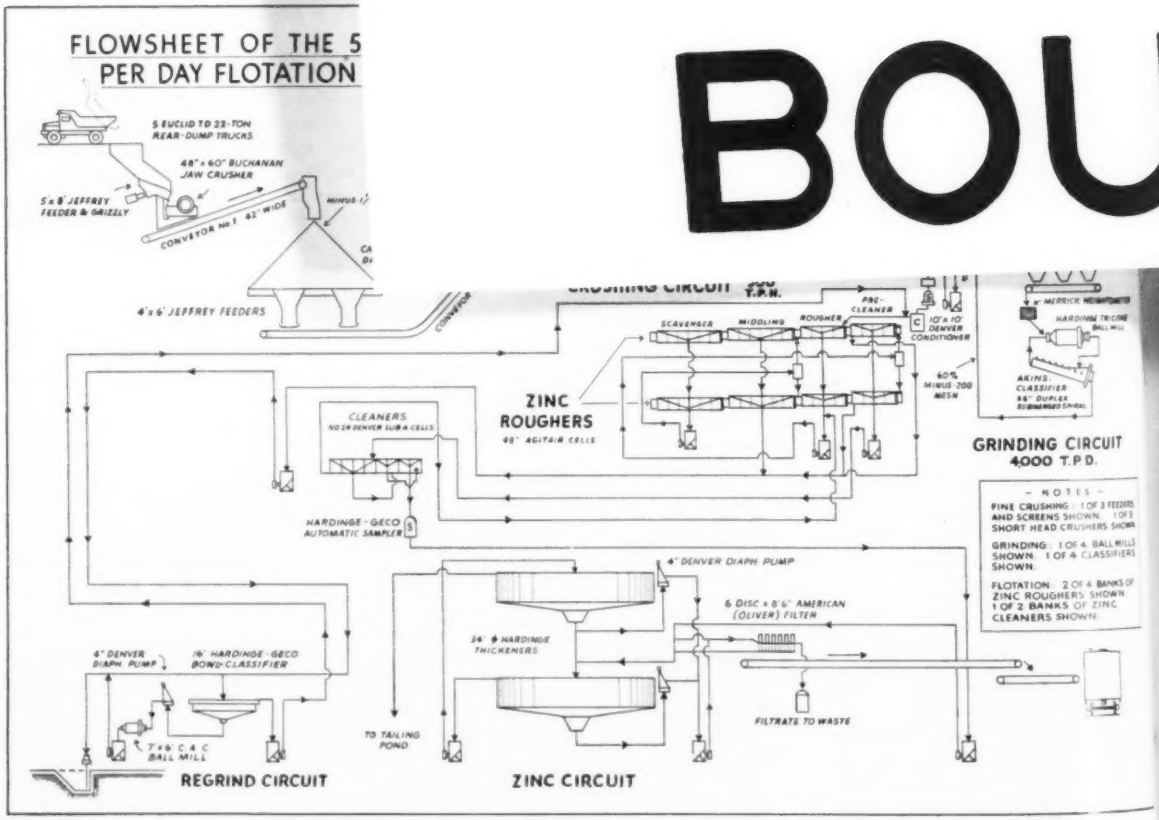
FLOWSHEET OF THE 5
PER DAY FLOTATION
5 EUCLID TD 22-TON REAR-DUMP TRUCKS
48" x 60" BUCHANAN JAW CRUSHER
5' x 8' JEFFREY FEEDER & GRIZZLY
CONVEYOR No 5 42" WIDE
MINUS ½"
4' x 6' JEFFREY FEEDERS
CRUSHING CIRCUIT
T.P.H.
SCAVENGER
MIDDLING
ROUGHER
PRE-CLEANER
10' x 10' DENVER CONDITIONER
60% MINUS 200 MESH
ZINC ROUGHERS
48" AGITAIR CELLS
CLEANERS
NO 24 DENVER SUB-A CELLS
HARDINGE-GECO AUTOMATIC SAMPLER
GRINDING CIRCUIT
4,000 T.P.D.
AKINS CLASSIFIER
NOTES
FINE CRUSHING: 1 OF 3 FEEDERS AND SCREENS SHOWN. 1 OF 3 SHORT HEAD CRUSHERS SHOWN
GRINDING: 1 OF 4 BALL MILLS SHOWN. 1 OF 4 CLASSIFIERS SHOWN.
FLOTATION: 2 OF 4 BANKS OF ZINC ROUGHERS SHOWN. 1 OF 2 BANKS OF ZINC CLEANERS SHOWN.
4" DENVER DIAPH. PUMP
6 DISC x 8'6" AMERICAN (OLIVER) FILTER
36' ϕ HARDINGE THICKENERS
FILTRATE TO WASTE
TO TAILING POND
4" DENVER DIAPH. PUMP
16' HARDINGE-GECO BOWL-CLASSIFIER
7'6" C.A.C. BALL MILL
REGRIND CIRCUIT
ZINC CIRCUIT

Each Hardinge Tricone grinds about 1,400 daily tons of ore. Since no coarse grinding units are installed, they accomplish an exceptional reduction in size—from minus-½-inch feed to 60 percent minus-200-mesh product. (Two-stage grinding was considered, but tests showed that single-stage grinding with middling recirculation was just as effective on the medium-soft ore. Single-stage grinding won because it was cheaper to install, and is simpler to operate.)

Each ball mill is powered by a 600-hp English Electric Co. squirrel-cage induction motor (as contrasted

All conveyor belts in the crushing plant are also driven through fluid coupling. They are easy on belts. They allow for starting smoothly with less maximum belt tension.

The flotation section is a broad area on the second floor. Control panels are in a central position, on an elevated platform. The flotation operator can see all his machines from this platform.

There are no windows in the flotation section. Lights are fluorescent. They throw uniform light upon the froth day and night, and thus make for easier, more accurate control by

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There is ample room for expansion in the entire plant. The crushing plant was designed to handle 500 tons per hour. The milling rate may soon be stepped up to 6,000 tons. (It actually is handling 1,400 tons per grinding unit now.) When this expansion comes, Barvue will have eliminated the commonest bottlenecks by advance planning: The Tricone mills are running slow—at low capacity. Speeding them up, by a change in gear ratio but no change in motor or fluid coupling, will be all that is necessary.

There is enough pit ore (down to 300 feet) to last for about five years. About 1955 or 1956, two years or so before the pit reaches ultimate depth, Barvue will sink a shaft in the footwall, explore the deposit at greater depth, and develop an underground operation. Slope belts will carry the ore right to the primary crusher.

Barvue will be a big factor in zinc for some years to come.

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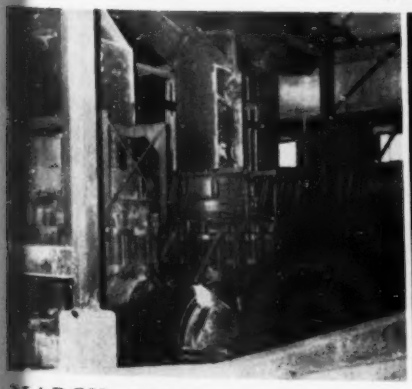
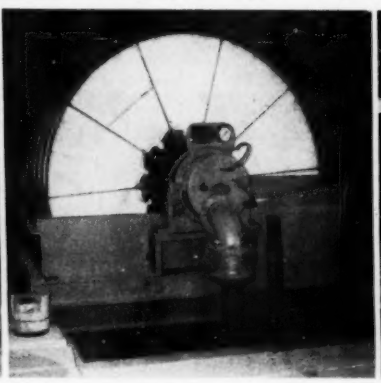
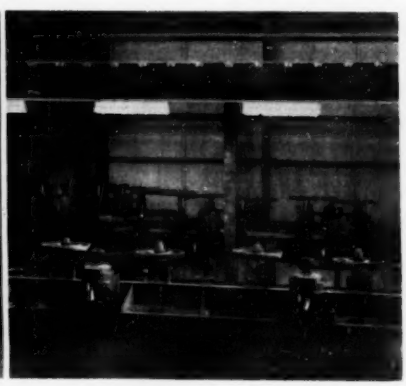
interior of the main tunnel, 7 feet wide by 9 feet high. ıe tailing area northeast of pit. Operator Origine Dionne ɔrior of the tubular conveyor way. The conveyor belt as- ɔf room alongside for a walkway.

LEFT: Symons 7-foot standard cone crusher (left) operates in closed circuit with two 5-foot 6-inch shortheads like the one on the right. CENTER: Zinc concentrate is dewatered by 8-foot 6-inch, 6-disc Oliver filter. RIGHT: The flotation section consists of No. 24 Denver "Sub-A" cleaners (foreground) and 48-inch Agitair roughers (background).







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Barvue site by Toronto Iron Works Ltd., and is of all-welded construction. Roughly 25 miles of welding went into it.

Above the catenary orebin, a traveling tripper conveyor distributes ore in the bin.

Trippers and Tunnels

The tripper conveyor is also arranged so that it can discharge to a separate crushed-rock (waste) bin. That arrangement provides minus-½-inch waste for use as road material; and with its open-pit mine, Barvue needs large quantities. The system works like this: Trucks bring waste from the stripping operation, discharge it at the crusher plant. After passing through the jaw crusher, it is shunted past the 8,000-ton coarse-ore bin, goes through the fine crushers to the traveling tripper, and thence to the crushed-rock bin. It is drawn into trucks as needed.

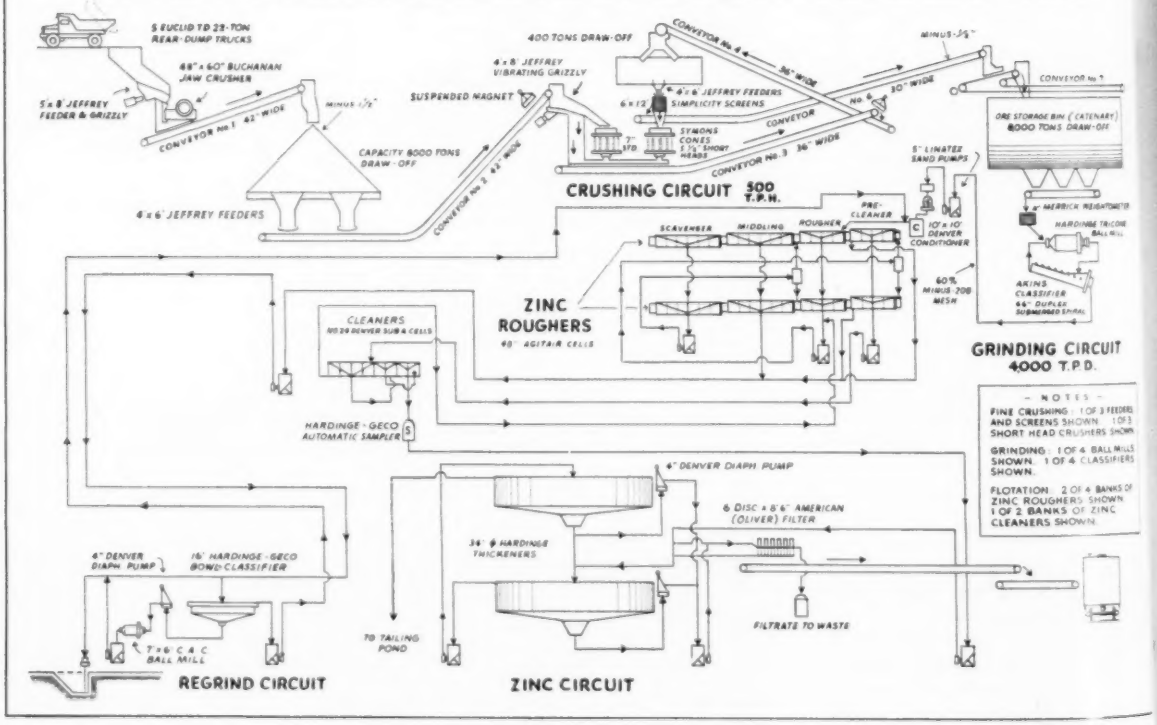
The underground tunnel system consists of 2,350 feet of tunnel in three sizes: Main tunnels were concrete-lined to 7 feet wide by 9 feet high. Lesser tunnels are 6 feet wide by 7 feet high. And some tunnels leading to small buildings are 3 feet wide by 6 feet high.

The main purpose of this tunnel network is to provide a warm accessible place for water, electric, and other utility lines, and to protect them from weather and open-pit blasting hazards. But there's another big advantage too: In the words of D. M. Isbister, general manager of Barvue, "on a cold day in February it will be a great help to me as I make my rounds."

Unusual Grinding Plant

Several more unusual features center around the four ball mill-classifier installations. These units are large, illustrate the modern trend toward larger units.

FLOWSHEET OF THE 500 TON PER HOUR CRUSHING PLANT AND 4,000 TON PER DAY FLOTATION MILL OF BARVUE MINES LIMITED, BARRAUTE, QUEBEC


5 EUCLID TD 22-TON REAR-DUMP TRUCKS
48" x 60" BUCHANAN JAW CRUSHER
5' x 8' JEFFREY FEEDER & GRIZZLY
CONVEYOR No. 1 42" WIDE
MINUS 1/2"
CAPACITY 6000 TONS DRAW-OFF
4 x 6' JEFFREY FEEDERS
400 TONS DRAW-OFF
4' x 8' JEFFREY VIBRATING GRIZZLY
SUSPENDED MAGNET
6' x 12' & 6' x 6' JEFFREY FEEDERS
SIMPLICITY SCREENS
SYMONS CONES 7" STD. 7½" SHORT HEADS
CONVEYOR No. 2 42" WIDE
CONVEYOR No. 3 36" WIDE
CONVEYOR No. 4 36" WIDE
CONVEYOR No. 5 30" WIDE
MINUS 3/8"
CONVEYOR No. 7
ORE STORAGE BIN (CATENARY) 8000 TONS DRAW-OFF
CRUSHING CIRCUIT 500 T.P.H.
5" LINATEX SAND PUMPS
6' MERRICK REIGHTMETER
HARDINGE TRICONE BALL MILL
AKINS CLASSIFIER 66" DUPLEX SUBMERGED SPIRAL
60% MINUS 200 MESH
10' x 10' DENVER CONDITIONER
PRE-CLEANER
SCAVENGER
MIDDLING
ROUGHER
ZINC ROUGHERS
48" AGITAIR CELLS
CLEANERS
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HARDINGE-GECO AUTOMATIC SAMPLER
6" DENVER DIAPH. PUMP
6 DISC x 8'6" AMERICAN (OLIVER) FILTER
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Each ball mill is powered by a 600-hp English Electric Co. squirrel-cage induction motor (as contrasted with the usual use of a wound-rotor motor where variation of speed is desired). The motor drives a fluid coupling which, in turn, drives a gear-reduction unit turning the ball mill.

This fluid coupling (Vulcan-Sinclair, made in England) is so designed that the motor is brought up to speed and then the fluid coupling picks up the load. The coupling has a 3 percent power loss, but has another desirable feature: it allows for a 10 percent variation in speed.

All conveyor belts in the crushing plant are also driven through fluid coupling. They are easy on belts. They allow for starting smoothly with less maximum belt tension.

The flotation section is a broad area on the second floor. Control panels are in a central position, on an elevated platform. The flotation operator can see all his machines from this platform.

There are no windows in the flotation section. Lights are fluorescent. They throw uniform light upon the froth day and night, and thus make for easier, more accurate control by the operator.

And in the Future

Barvue will probably go to automatic control in spots where it proves effective and economical.

The mill building is all set for installation of pyrite flotation cells. The flowsheet is designed. It will be installed quickly with little change if the market for pyrite continues to be attractive.

A complete ore-dressing laboratory has been set up in space provided in the mill. It is for routine control work, and also for research into methods of ore treatment—for Barvue's and other ores.

There is ample room for expansion in the entire plant. The crushing plant was designed to handle 500 tons per hour. The milling rate may soon be stepped up to 6,000 tons. (It actually is handling 1,400 tons per grinding unit now.) When this expansion comes, Barvue will have eliminated the commonest bottlenecks by advance planning: The Tricone mills are running slow—at low capacity. Speeding them up, by a change in gear ratio but no change in motor or fluid coupling, will be all that is necessary.

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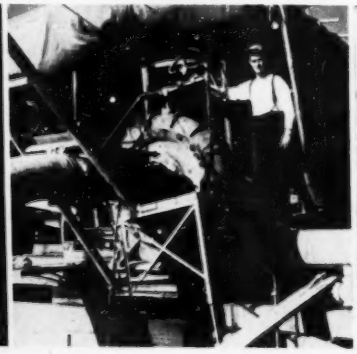
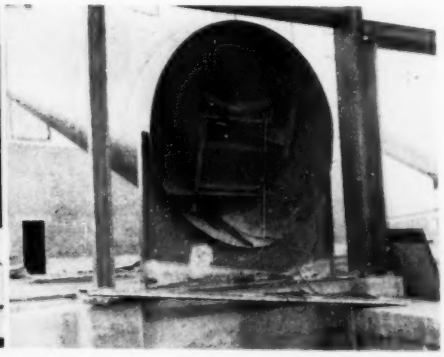
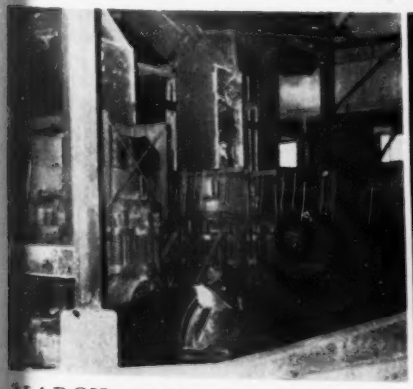
Barvue will be a big factor in zinc for some years to come.

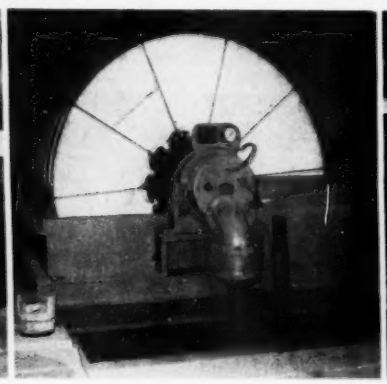
LEFT: Service-and-access tunnels mean no frozen water lines for Barvue. This is the interior of the main tunnel, 7 feet wide by 9 feet high. CENTER: This 12-inch Georgia Iron Works Company centrifugal sends the pulp to the tailing area northeast of pit. Operator Origine Dionne is a fourth cousin of the famous Dionne quintuplets. RIGHT: Special view of the interior of the tubular conveyor way. The conveyor belt assembly fits against one side of the 10-foot tube with plenty of room alongside for a walkway.

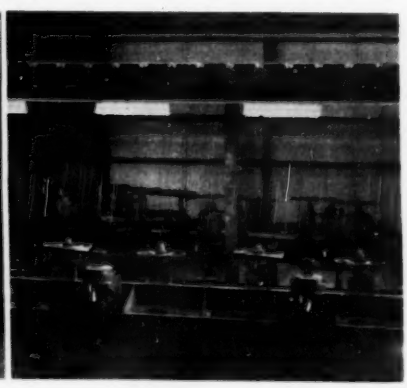


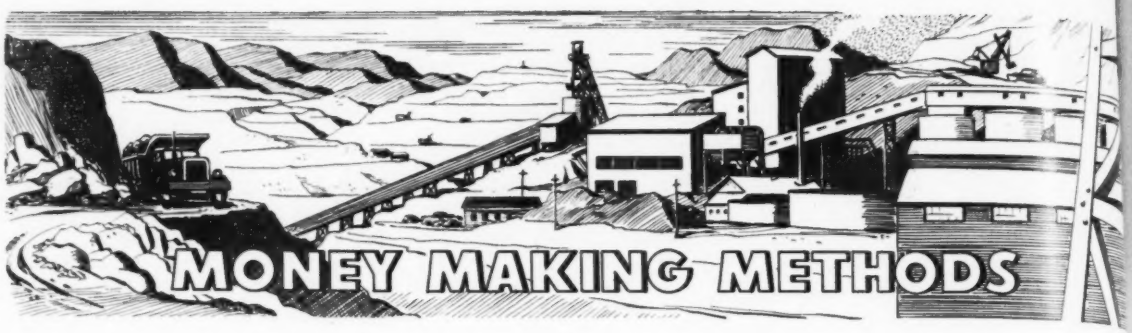


LEFT: Symons 7-foot standard cone crusher (left) operates in closed circuit with two 5-foot 6-inch shortheads like the one on the right. CENTER: Zinc concentrate is dewatered by 8-foot 6-inch, 6-disc Oliver filter. RIGHT: The flotation section consists of No. 24 Denver "Sub-A" cleaners (foreground) and 48-inch Agitair roughers (background).



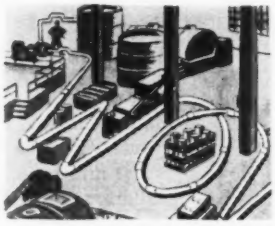






PUMP MAINTENANCE - - -

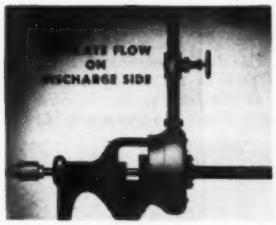
How and Why of Centrifugal Pumps is the new Allis-Chalmers Manufacturing Company's training film.
PREVIEWED HERE. You can get a copy from AC for your mine and mill educational program.



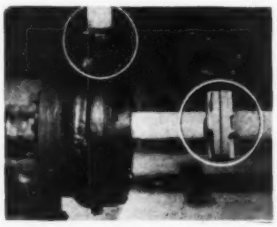
1. Keep your piping simple. Don't duplicate bends shown here.

2. Use a good pipe [illegible] on each joint—and [illegible] tighten it.

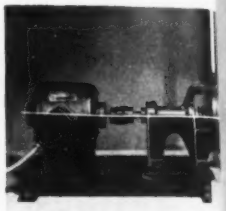
3. Use a foot valve on intake line to keep pump primed.



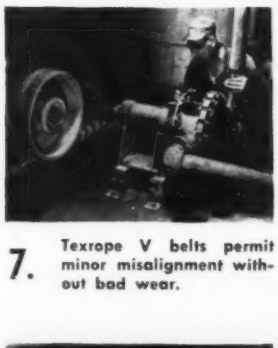
4. Regulate flow on discharge. Do not use valve on intake.



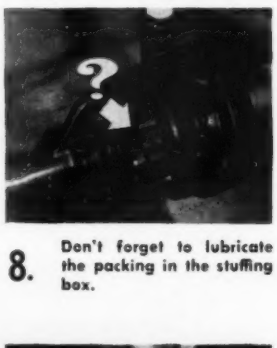
5. Line up pipes for connection ease with no leakage.



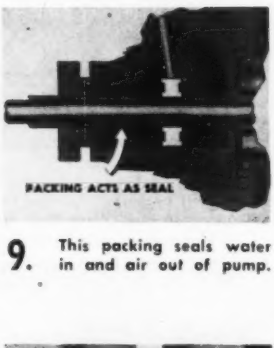
6. Correct pump and [illegible] alignment means no [illegible] ing strain.



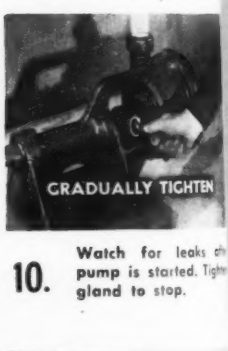
7. Texrope V belts permit minor misalignment without bad wear.



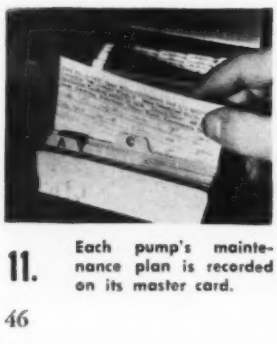
8. Don't forget to lubricate the packing in the stuffing box.



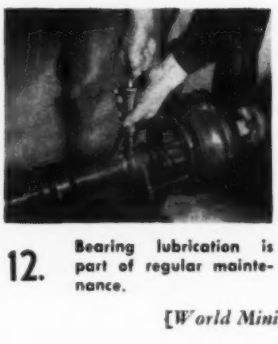
9. This packing seals water in and air out of pump.



10. Watch for leaks [illegible] pump is started. Tighte gland to stop.

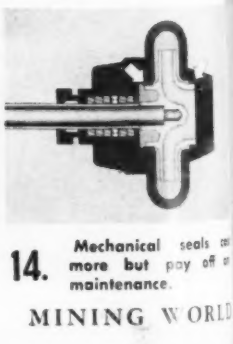


11. Each pump's maintenance plan is recorded on its master card.



12. Bearing lubrication is part of regular maintenance.

13. Stop excessive leakage by replacing packing.



14. Mechanical seals [illegible] more but pay off [illegible] maintenance.

Sinking crews have just finished wiring a round of holes in the Free State Geduld No. 2 shaft bottom. This picture was taken before the sudden water inrushes.

SURFACE WATER PUMPED INTO SHAFT

Sounds crazy but engineers did this at the 5,350 foot deep Free State Geduld No. 2 shaft to equalize inflow pressure to permit pouring a concrete plug

Large columns of water under high pressures have been found to feed many water-bearing fissures cut while sinking the deep shafts in the Orange Free State, South Africa. Pressure is generally due to static head of the water column, but on occasions is augmented by gas or rock pressures. Pressures at depths of less than 4,000 feet have been as high as 2,100 pounds per square inch, yet static pressure for 4,000 feet is only 1,736 pounds. Inflows of as much as 665 gallons per minute through a two-inch-diameter pipe have been measured.

The mining companies have developed a system of pattern diamond drilling ahead of all development faces to locate these water-bearing fissures in or near the ground through which the development heading is to be advanced. Cement grout is injected at high pressure into any hole in which water is encountered. These holes are then redrilled five to 10 feet ahead of the original depth. If water is again found, the hole is regrouted. Normal practice has been to drill a pattern of six holes 70 to 80 feet ahead of sinking and to drill four holes 100 feet deep ahead of level development. This procedure is referred to as "cover." The number and pattern of the holes determine whether it is "preliminary cover" or "full cover."

The Anglo American Corporation of South Africa Limited has been the largest developer in the Free State. It formed a special company known as the Board Products South Africa Limited to undertake this drilling. In 1951 the company drilled 237,951 feet of diamond drill hole in the Free State for "cover."

The system has proved its value and the development of the Free State mines would have been impossible without it. Despite these precautions, some mine floodings have occurred. Here is what happened at the No. 2 shaft of the Free State Geduld Mines, Ltd. at Welkom, Orange Free State, and how the engineers planned and carried out the mines' dewatering.

In September 1952, sinking of this seven-compartment shaft was in progress below the 5,350-foot level through badly fractured ground and close to the planned depth.* Despite the normal "cover" precautions, water inflow was creating a serious problem. The engineers decided, therefore, to pour a concrete plug 35 feet thick in the shaft bottom to counteract the pressure of the water flowing from the shaft bottom. The plug was poured around the grouting pipes extending into the rock below the bottom. The plug had been poured and development of the 5,350-foot level started when on September 9th water-bearing fissures were cut by the headings only a short distance from the shaft. The combined

(*Continued on page* 85)

* Mechanical mucking with a "Grab" and sinking operations at the shaft were described in the April 1952 issue of *Mining World* as part of the article titled "'Grab' Speeds Shaft Sinking."

TURNING KILOWATTS TO GOLD

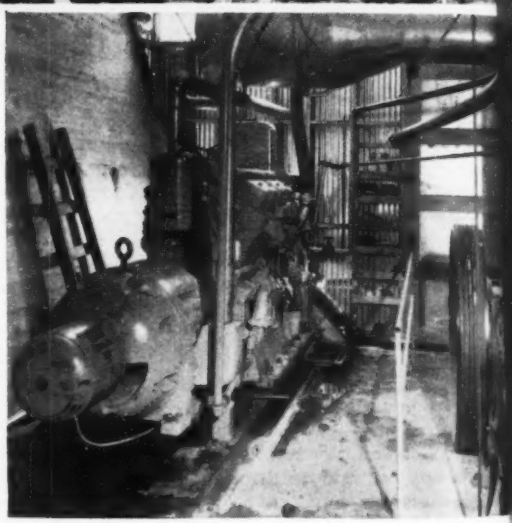
Gold is where you find it, and wherever you find it you need dependable power to mine it profitably. Eight thousand feet up in Nevada's Kingston Canyon, the Kingston Mine relies on a Caterpillar Diesel D364 Electric Set.

In this remote but important location, a 50-ton flotation mill, all electric motors and lights and a motor-driven air compressor are powered 24 hours a day, every day in the year, by a Cat Electric Set that is practically turning kilowatts into gold. Kingston Mine's Superintendent E. B. Crouch insisted on Caterpillar Diesel power for this job because of past experience with Caterpillar products.

The D364 puts out 165 KW for uninterrupted 12-hour duty. Its fuel system requires no adjustments and uses inexpensive, non-premium fuels without fouling.

There are 12 sizes of Diesel electric sets and your Caterpillar Dealer will be glad to explain and demonstrate their advantages for you. He's the man to see for service, too, and for those genuine Caterpillar parts which guarantee you the same Caterpillar quality that's built into every one of these Diesel engines and electric sets.

CATERPILLAR, SAN LEANDRO, CALIF.; PEORIA, ILL.



CATERPILLAR

REG. U. S. PAT. OFF.

Diesel Engines
Electric Sets

prominent Iron Range lors filled the audito- of the Duluth Branch e University of Minne- for the technical and business sessions.

INNESOTA MINERS TALK BLASTING ND BENEFICIATION AT SYMPOSIUM

hen mining men from Minne- get together, they usually dis- the problems of the rapidly nging industry in their area. This xactly what they did when they ered in Duluth in mid-January the three-day meeting of the nesota Chapter, AIME, and the annual Mining Symposium ducted by the University of nesota. The speakers at one of smoothest running conventions held concentrated largely on ting theory and techniques, eficiation of fine intermediate , flotation, and other subjects to the continuance of large-scale iron production from the Lake Superior district.

Over 490 industry leaders registered for the Symposium which represented an increase of some 85 over the best previous year. Attendance at the AIME dinner exceeded 470, up more than 100 from 1952.

Many of the problems in making an economic recovery of iron from low-grade materials are closely parallel to those experienced by the non-ferrous metal mining industry in handling low-grade copper, lead, and zinc ores. Unfortunately, the techniques already developed for these materials cannot be adapted to the treatment of iron ores without substantial modification. Papers describing the progress of experimental work on these modifications are responsible for attracting record turnouts.

Flotation

In the evolution of beneficiation on the Ranges, papers delivered at Minnesota meetings have often outlined successful commercial practices to follow. If this continues to hold true, we may expect to see a trend toward flotation for the treatment of several types of material. One full morning session of the Symposium was devoted to this subject.

Earl C. Herkenhoff, Pickands Mather and Company, read an article prepared by Fred D. DeVaney, also of P-M, and himself entitled "The Nature of Flotation Processes." The paper was completely basic in its approach—a position appreciated by a group whose experience in flotation has been extremely limited. It stated the theory of flotation and outlined the fundamental reactions of the various types of iron ores under various conditions of particle size, desliming, etc. Also, it defined the major difference between the successful flotation of iron and the non-ferrous sulphides; that is, the effect of any known collector on iron oxide particles is similar to the effect it has on some of

MINNESOTA AIME OFFICERS

Officers named by the Minnesota Section AIME for 1953 are: chairman, Lloyd J. Severson, Oliver Iron Mining Division, United States Steel Corporation; vice chairmen, John L. McEachin, Minnesota Power and Light Company, Eugene P. Pfleider, professor, Mines and Metallurgy, University of Minnesota, and Fred D. DeVaney, Pickands Mather Company; secretary-treasurer, Everett L. Joppa, Pickands Mather Company. Shown are Severson, Pfleider, and Hugh Leach, retiring president.

Guy V. Woody, manager, Processing Machinery Department, Allis-Chalmers Manufacturing Company, reported on the company's new process for hardening taconite pellets.

the gangue materials. Hence, it is difficult to get a high percentage recovery of the iron mineral without pulling waste into the froth and reducing the grade.

Work which preceded the construction of the mill at the Humboldt mine in Michigan, the district's first commercial flotation plant, was described by E. B. Johnson, senior metallurgist, Cleveland-Cliffs Iron Company. His remarks attracted much attention because this work may point the way to important production from the so-called "jasper" of Michigan which exists in considerable abundance.

Cleveland-Cliffs has long been interested in treating this low-grade hematite (approximately 30 percent iron), and determined quite early in the experimental work that it floated readily and at relatively coarse particle sizes in an acid circuit. Seeking to avoid the mechanical problems inherent in acid circuits, test work was carried forward for several years; present indications are that an economically and metallurgically practical way of floating in an alkaline circuit has been achieved.

Lively floor discussion following this session seemed to indicate a much greater interest in flotation than might have been expected.

Gravity Concentration

Treatment of fine particle sizes of intermediate grades of ore continues to receive considerable attention. Virtually all ores classed as "intermediate grades" have yielded to washing, jigging, HMS, or some similar treatment in the larger particle sizes. Fines continue to baffle, and challenge, the operators.

George Marincel, beneficiation engineer of the Charleson Iron Mining Company, described progress his firm has made in the production of concentrates by jigging. Charleson crushes its ore and treats the entire feed in jigs without screening it into various particle sizes. Results have been good, but iron losses in the very fine sizes have been quite high. For the past two years this company has been making an intensive study of ways to improve this recovery, and considerable progress is indicated.

Probably the fines treatment method receiving the most attention during the past two or three years has been that which employs the Dutch State Mines Cyclone as a concentrator. This method, using a high gravity liquid, is meeting with considerable commercial success on some ores. It was discussed by Earl

W. R. Moore, president of the iron mining company bearing his name, presided at the AIME sessions.

Herkenhoff of Pickands Mather and Company who, as a metallurgist for American Cyanamid Company, participated in the first cyclone pilot plant work on the Range.

Mr. Herkenhoff's paper would make a good text book on concentrating iron ore in a cyclone. It could probably be better used as a handbook by any metallurgist contemplating experimental work with the unit. It is a revealing account of carefully controlled test work, and it should serve to help define the logical fields of application of the cyclone as a concentrator.

Pellet Problems

Making a usable blast furnace feed of fine iron concentrate is still the most troublesome aspect of beneficiating taconite and jasper. Pelletizing is currently favored by most Iron Range operators, but none of them are completely satisfied with present methods of [hardening] or hardening the pellets to make them withstand rough handling. Burning them in a vertical [shaft] ney-like, furnace works, but not too well.

Allis-Chalmers manufacturing Company has been doing experimental work on a process for hardening these pellets on a continuously moving grate. Guy V. Woody, manager, Processing Machinery Division, gave an interim report on the work. Information contained in the report was based on the data available from about seven hours of operation. Even this limited testing produced satisfactory pellets both from the standpoint of size and hardness.

In the tests, pellets running 10 to 10.9 percent moisture and having a screen size of plus -3/8 inch to minus -3/4 inch were dried to 9 percent moisture in a drum and discharged onto the moving grates. Pellets on the grate weighed 135 pounds per cubic foot. Operating at a speed which allowed 90 minutes over the suction boxes, the pellets were burned to a weight of 116 pounds per cubic foot with the consumption of 650,000 Btu per ton. The grate discharge screened at 96.5 percent plus-to-mesh. Tumbling plus -3/4 inch pellets in a drum for 100 revolutions at 24 revolutions per minute produced 12 percent minus-1/4-mesh fines.

Indications are that a reduction in firing time to 45 minutes would not adversely affect the product if permeability of the pellets is improved by further moisture reduction in the pre-drying drum. This increased grate speed and certain other fac-

Eugene Pfleider, assistant professor, School of Mines and Metallurgy, University of Minnesota, outlined aspects of the Paley Report *Resources For Freedom* that pertain to the iron mining industry.

tons should, it is believed, sharply reduce the Btu requirement.

The pilot plant is undergoing alterations indicated by the early work, and testing is expected to be resumed in the immediate future.

Improving Breakage

As the ores mined become harder, the rules of the thumb that governed blasting of merchantable ores are no longer good enough. They are rapidly becoming a luxury no company can afford. For the past several years, the program of the Symposium has taken notice of this fact. This year, a panel of three experts conducted the blasting discussions.

Fundamentals of explosives and blasting were the subject of F. D. Bickel of the du Pont company. Mr. Bickel explained the action of the several types of explosives and detonators and discussed the reasons for using certain types of explosives under various conditions.

Detonators and their effect on fragmentation was the subject of Fred D. Wright, U. S. Bureau of Mines, as he described experiments conducted by the Bureau. Tests, under controlled conditions and photographed by high speed motion picture cameras, seemed to show that the length of delay between shots when shooting a round has a pronounced effect upon the size of broken material produced. Rounds shot with standard delay caps produced more large chunks than those shot with millisecond delays. However, insufficient delay between shooting of rows caused excessive throw of broken material.

The tests seemed to show that about 100 milliseconds should be allowed between detonation of successive rows to insure that the rock from the first rows moves out enough to unburden the next row. Unless there is an adequate delay between detonation of successive rows, the later rows must break as crater shots toward the only free face available. This means less rock broken and excessive throw of material away from the face.

The operating touch was added by Lyle F. Campbell of the M. A. Hanna Company. He has been conducting extensive experimental work in the field at Hanna properties with a view toward improving hole placement, loading, stemming, etc., that would result in reduced breaking costs. Planned blasts were photographed and the pictures studied. As a result, certain practices were standardized, such as stemming and tamping each churn drill hole with 4 feet of dry material above the charge before filling with drilling mud, and efficiency has been improved.

E. S. Johnson, senior metallurgist, Cleveland-Cliffs Iron Company, described preliminary ore beneficiation practices on the Marquette Range in Michigan.

Oliver C. Ralston, chief metallurgist, U. S. Bureau of Mines, discussed manganese and indicated Minnesota's Cuyuna Range deposits are among the United States' most promising from a reserve standpoint.

Paley and Iron Ore

A brief but interesting analysis of the Paley Report, *Resources For Freedom*, was given by E. P. Pfleider, associate professor of Mines and Metallurgy, University of Minnesota. A general review of the purpose of the report was followed by an outline of the part the Lake Superior Region would be required to play in iron ore production according to the estimates given. On the basis of anticipated increased requirements of iron ore by 1975, the region will have to produce about 90,000,000 tons of shipping product annually. The decrease in production from high-grade reserves will be offset by taconite concentrates.

Blasting experts (left to right) F. D. Bickel, E. I. Dupont de Nemours and Company; Fred D. Right, mining engineer, U. S. Bureau of Mines; and Lyle F. Campbell, M. A. Hanna Company, all presented papers at the Symposium.

The expansion in consumption of some 60,000,000 to 70,000,000 tons of ore will be met by shipments from Canada and Venezuela, with the likelihood that a volume approaching 65,000,000 tons per year can eventually come from these sources; that by continuing a wise and timely development of available possibilities, the United States can meet its iron ore and steel requirements without any sharp increase in real costs.

Pfleider's discussion of the Paley Report on manganese was augmented by O. C. Ralston, chief metallurgist, U. S. Bureau of Mines, who described several available manganese ore possibilities. His conclusion was that domestically produced and beneficiated ores could never compete with foreign ores on a cost basis. On the other hand, he was optimistic that any emergency situation could be met and that even regular long-term demand could be satisfied—but only at a price.

He indicated that reserves on Minnesota's Cuyuna Range were probably the best known source for somewhat economical production of high tonnages.

Phillip Merritt, assistant director, Division of Raw Materials of the U. S. Atomic Energy Commission and former geologist on the Range, discussed the present and potential sources of fissionable material. He surprised the gathering by explaining the degree to which private industry is already involved in atomic energy. Seven of the eight processing plants in the west are privately operated, according to Mr. Merritt. Three more are planned for construction.

Charles Will Wright*

Charles Will Wright Recommends

MINERAL CONSOLIDATION

Over-staffed federal agencies, at home and abroad, should be cut and duties combined under a new Under Secretary of Mineral Supply

We cannot maintain our key position as a world power unless we are able to supply our metal industries with their essential raw mineral requirements. A large percentage of these requirements have been coming from countries now under the control or influence of the Soviet Union or where politics is preventing the export of minerals and metals to the United States.

The defective foreign mineral policy of the State Department has not improved our position relative to mineral imports, nor has that department done anything to help our mining companies abroad in their struggle against unfair taxation and the rising tide of nationalism. We must now establish ways and means of rebuilding our relations in the foreign field in order to increase the flow from abroad of the mineral products so essential to all of our industries. A Civil War general once said that the principle of winning a fight is "*to git thar fustest with the mostest men.*" We now need minerals more than men.

Our Present Position

Our mineral resources which were the impetus in developing American industry have been largely depleted during the two world wars and our dependence upon imports has greatly increased. Table No. 1 indicates our present position as producer and consumer of iron ore, manganese ore, and base metals, and also the estimates for 1975. Our future policy should be to strengthen the domestic mining industry where economically feasible, to encourage the development of foreign mines by private enterprise, and to increase mineral imports from every possible source—both for defense and for our growing industries. We should also conserve certain of our domestic ore reserves and reduce the waste of used or secondary metals.

Our Metal and Mineral Needs

Study of Table No. 1 will show the seriousness of our position in reference to raw material supplies. In 1925 we were an important exporter of the base metals, but are now dependent upon imports for a large percentage of our mineral requirements. In 1975 our estimated needs will be far greater than the estimated domestic production.

The vital question before us is, where in the world can we get the extra 1,000,000 tons of copper, the 900,000 tons of lead, the 750,000 tons of zinc, the 80,000,000 tons of iron ore and the 1,500,000 tons of manganese to meet the estimated requirements of 1975.

These estimates for 1975 have been questioned by the heads of some of our mining companies as being too low for production and too high for consumption. Many of our mining men are convinced that by extended geological surveys, followed by exploration in the undeveloped areas within the United States our mineral reserves can be largely increased. They advocate that funds for exploration and mine development in the United States be increased and less spent in foreign fields. Greater conservation of our scrap metals is also advocated as this is an important source of supply.

Among other mineral requirements we now depend upon imports for nearly 100 percent of our tin, cobalt and rare metals, 95 percent of our nickel and chromite, 90 percent of our manganese, and 60 percent of our bauxite (aluminum ore).

The problem is far more serious than is generally believed, and, despite all of the studies and warnings by the presidential committees and other federal and private organizations, there is still no legislation in effect and no follow-up on the recommendations made. Unless the new administration cooperates with the mineral producing nations, unless our mining industries can favorably invest in the development of foreign sources for mineral imports to the United States, our industrial growth soon will be checked.

Since World War I

Autarchy in the mineral industries became a dominant objective

* Well-known consulting mining engineer who was for many years manager of mines in Europe. He has been Chief of the Mining Division and Chief Foreign Mineral Specialist for the U. S. Bureau of Mines.

during and after World War I in Germany and other nations with nationalistic tendencies. Rather than export raw minerals and import metal products, those countries with building industries decided to produce their own steel and base metals. This tendency spread from Europe to Latin America, and during the past two decades our industries have been deprived of many of the mineral supply sources from which we obtained our raw-mineral requirements. The underdeveloped countries that produce these products have become more conservation minded to the disadvantage of the industrial nations.

Discrimination

In most countries where our forward looking mining companies have spent millions in the development of mines, the local governments have imposed high export taxes, discriminatory exchange rates, and controls, and thus have made profitable exploitation most difficult as in Chile and Brazil, or impossible as in Argentina and Bolivia. Our government, on the other hand, has made no effort to protect the interests of the American companies which are producing the raw mineral products abroad so vital to our industrial development. Interference by foreign governments has also prevented, in part, the flow of minerals and metals to the United States.

Under the retired administration, foreign governments were encouraged by loans and gifts to build their industries under government control. Private enterprise with profit objectives was discouraged, and the incentives that induce the expansion of output under free enterprise have been impeded.

Mineral Surveys

From 1935 to 1945, the U. S. Bureau of Mines foreign mineral specialists in cooperation with the foreign service officers of the Department of State made detailed surveys of the mineral resources of the principal mineral-producing countries of Europe, the Soviet Union, Asia, and the Latin American republics. These surveys, published by the U. S. Bureau of Mines, were used extensively by industry and government, particularly in connection with the problems of mineral supply during World War II. They presented many favorable opportunities for mine development and the production of the metals we need, but, in view of the political situation and risks involved, our mining companies hesitated to venture abroad, except in the British-controlled areas where they were assured of fair treatment, and, more recently, in Peru where the new mining code favors mine investment and in Mexico where labor is cheap and there are no exchange controls.

Objective of the Soviets

One of the main objectives of the Soviet Union is to prevent the United States from acquiring the necessary raw material products for the maintenance of our defense as well as our private industries. This is being done by stopping the flow of raw materials from the U.S.S.R. to the United States and by encouraging the nationalization of domestic industries as in Bolivia, embargoes on exports as in Argentina, and the imposition of high export prices on copper as in Chile. But still more serious was the conquest of China, our main source of tungsten and antimony, by the Soviet Union and their threat of eventual domination of the Iranian oil fields and the Malayan tin fields; and even the control of manganese ore exports from India. Thus, Russia has, and is increasing, its control of mineral supply at our expense, while our government is doing little or nothing to counteract it.

Our Mineral Agencies

Within our government is a long list of agencies with far too many specialists dealing with various phases of the mineral industries here and abroad many of which are duplicating the work and are in conflict with one another. One important official who attends the inter-agency conferences states that 80 percent of the time in conferences is taken up with questions of authority conflicts, and because of the various authority assignments a party desiring a government contract may have to wait months instead of days for a final answer.

Among the disturbing factors, as mentioned by one of our Defense Minerals Procurement Agency officers abroad, is the lack of a definite foreign policy and sudden changes in mineral requirements which upset development projects.

These over-staffed federal agencies dealing with mineral supply, both at home and abroad, should be reduced because of conflicting policies and duplication of work which often cause delays in acquiring the needed mineral products for our defense program.

Suggested Action

It is quite evident that the world's mineral resources would be adequate to supply the needs of all nations to meet the ever increasing peace-time industrial requirements if (1) unimpeded trade between nations were established, (2) the law of supply and demand were allowed to function without restrictions and, (3) investments in mine developments through private enterprise were encouraged. But most nations, including the United States, are opposed to all three of these vital conditions for their own industrial welfare.

The recent report *Resources for Freedom* by the president's materials policy commission suggests ways of stabilizing commodity prices on a global scale by means of world agreements on the distribution of raw materials, the establishment of international stockpiles, and the elimination of import duties and export taxes on metals and minerals. The report also strongly favors government assistance to private foreign investment directed toward expansion of foreign mineral production.

To get all nations to agree and to maintain agreements on distribution and prices for mineral products over a period of years would be next to impossible. Individual producers rather than sell at a fixed price will find some way to sell to the highest bidder regardless of government

Table No. 1

United States Consumption of Primary Metals and Ores In Key Years

Commodity	1925		1950		1975	
	Production	Consumption[2]	Production	Consumption[2]	Production	Consumption[2]
Copper	840,000	610,000	920,000	1,310,000	800,000	1,800,000
Lead	640,000	600,000	420,000	950,000	300,000	1,200,000
Zinc	720,000	520,000	590,000	970,000	730,000	1,500,000
Iron ore	62,000,000	72,000,000	98,000,000	104,000,000	130,000,000	205,000,000
Manganese ore	90,000	820,000	187,000	1,170,000	200,000	1,800,000

[1] Estimates from *Resources For Freedom*.
[2] Consumption figures include only production from domestic ores and net imports. Statistics from U. S. Bureau of Mines *Minerals Yearbook*.

controls, or they will stockpile their products. Government controls may be advantageous in cases of emergency but are to be discouraged in peace time. As for the elimination of import duties, the United States mine operators would be the first to object. The suggestion that our government assist private foreign investments in the expansion of foreign mineral production cannot be too strongly emphasized, *but this depends more upon what the foreign governments are willing to do to encourage private investment than upon what our government may eventually do.*

Guarantees to USA Investors

Under the Mutual Security Act, guarantees are offered to private American investors against confiscation and convertibility on new industrial projects, up to a total of $200,000,000. For this guarantee, a premium of 1 percent per year on the invested capital is required. Up to January 1, 1952, 34 guarantees were issued, the fees amounting to $394,009 collected and nothing was paid out. These guarantees covered manufacturing plants, an oil pipeline, a carbon-black plant, etc., but no mine development project was included.

Before investing in a mine project group abroad, private capital must be assured that the invested capital will not be confiscated overnight without due compensation and that profits can be converted into exportable dollars. Just how such guarantees can be given is a matter for our government as well as the local governments to decide in the individual cases.

Proposed Commission

To get foreign countries, particularly those of Latin America, to revise their mining codes, taxes, and exchange controls so as to favor private foreign investment in mine developments, a small group of outstanding mining men should be selected to visit the principal mineral-producing countries. With the help of the United States Embassies, this group should discuss with the local government mine officials and law makers the ways and means to accomplish just this. The local governments naturally want a large share of the profits to be derived from the exploitation of their mineral resources. In several instances, as in Brazil and Venezuela, long-term government contracts have been made by our large steel and oil companies resulting in real benefit to both parties.

It should not be too difficult for our private mining interests to arrange similar contracts with the owners of deposits of strategic minerals worthy of development.

Increased output of minerals for export would be a big help to the economy of the nation concerned. It should therefore be willing to facilitate the flow of capital necessary to increase the output from old as well as newly discovered ore deposits by reducing the border barriers that now delay or prevent deliveries from producer to consumer.

Reorganization

Among the most important undertakings of the new administration is the establishment of a definite national mineral policy. Probably the most difficult one is that of uniting our numerous government agencies dealing with metals and minerals under a single administrator with full authority to operate on a business basis without political interference. Such reorganization is essential in order to build up a united front and firm policy to combat the forces now striving to deprive us of our vital mineral supplies from abroad. It is also essential to reduce the time-consuming red-tape requirements to obtain approval of contracts applied for by private industry. At present contracts require the approval of several agencies too conscious of their delegated authority.

But most important is the need to centralize the fact finding and reporting on the mineral industries, particularly those abroad, under the old established U. S. Bureau of Mines, today the main source of information, and to eliminate the large staffs in the other federal agencies that are duplicating this basic work.

The Commission on Organization of the Executive Branch of the Government (Hoover Commission) in January 1949 made the following recommendations:

"Consolidation in the Economics and Statistics Branch of the U. S. Bureau of Mines of all responsibility for the collection and economic interpretation of data on mineral resources, mining operations, and the international reserves and movements of metals and minerals. This will require transfer to this branch of responsibility for studies now widely scattered throughout numerous Government agencies, such as the Department of Commerce, the Tariff Commission, and the National Security Resources Board. The Economics and Statistics Branch should make all provisions necessary to insure the highest standards of reliability in gathering mineral and production statistics, in conducting economic studies, and in publishing the results in a form that will meet the basic and, insofar as possible, the special needs of all other Federal agencies, the mineral industries, and the public generally."

In reference to the changing mineral position of the United States the report states:

"As happened after World War I, a surplus of metals and an accumulation of metal stocks was expected after World War II. Just the opposite has taken place. A continued high level of industrial activity has brought all around metal scarcity and acute supply problems."

In March 1949 a report to Congress by the same Commission on "Organization of the Department of Interior" stated as follows:

"There is grave need for a center of mineral services in order to develop mineral resources, to advise on broad national policies, to administer the government leases and mineral reservations, to recommend revision of mineral laws, and to advise other agencies of the government.

"There are some 25 agencies in the government which have to do with mineral resources. They involve extensive duplication, much of which could be avoided by a consolidation and a more systematic source of information and advice. The Reconstruction Finance Corporation and the National Security Resources Board are important cases in point."

In conclusion, the logical solution of the problem would be to unite all of the agencies under a competent administrator in the Department of Interior as *Under-Secretary of Mineral Supply* with full authority to supervise all government agencies dealing in mineral resources and supply. He would delegate authority to men of wide experience in each field of activity, and would cooperate fully with the Secretary of Defense in carrying out the most effective ways and means of obtaining our mineral supplies for defense and for our increasing industrial needs. Furthermore, as a large percentage of these supplies will necessarily come from abroad, it is imperative to conclude on a sound basis ways and means of obtaining these required metals and minerals through private enterprise.

ACTIVITIES OF U. S. MINING MEN

Promotions at the Darwin and Shoshone Mines Division (California) of the Anaconda Copper Mining Company include: **Harold V. Stewart** from stope geologist at Darwin to superintendent of Shoshone mines; **J. H. Bailey** of the Darwin staff replaces Mr. Stewart; **John T. Eastlick,** recent transfer from Butte, Montana, to stope geologist specializing in the oxide section of the Darwin mine; **Andrew B. Cunningham,** to mine engineer at Darwin, replacing **Albert F. Glenn** who has taken a lease on the Reed mine at Lee Flat; **Ralph Perhac** from the sampling department at Butte to become Mr. Cunningham's assistant.

Alvin H. Ross, a Canadian expert in the refining of radioactive ores, has been appointed assistant to Marvin Kay, vice president and general manager of Colorado's Climax Uranium Company.

Ralph E. Knight, former assistant manager of the chemical division, has been promoted to director of research and development for the aluminum and chemical divisions of Kaiser Aluminum and Chemical Corporation. **W. R. Woodman,** former manager of chemical division operations, has been named manager of the chemical division.

Leslie J. Bechaud resigned from his position as chief research metallurgist for the Hanna Coal and Ore Corporation to take a similar job with the Newmont Mining Company. **Elton Geist,** former superintendent of Hanna's Groveland pilot plant, has taken over Mr. Bechaud's duties at Hibbing, Minnesota.

Robert H. Nelson and **Irving G. Irving** have set up offices as mining consultants at 43 Hirbour Building in Butte, Montana.

Dwight H. Plackard, secretary of the New Mexico Mining Association for the past two years, resigned on March 1 to return to the public relations field. He and a group of Albuquerque associates will publish a weekly newspaper.

James Ivers was elected president and general manager of the Silver King Coalition Mines Company in Park City, Utah. The former vice president and general manager succeeds **Thomas F. Kearns, Sr.,** who sold his stock interest in the company

ROBERT C. STEPHENSON has recently resigned as assistant state geologist of Pennsylvania to accept a position in the mineral division of Woodward & Dickerson, Inc., of Philadelphia, an import-export firm handling raw materials. Active in the affairs of the AIME, Mr. Stephenson is currently eastern vice chairman of the Industrial Minerals Division and formerly served as chairman of Papers and Programs.

to the American Smelting and Refining Company. **M. G. Heitzman** was named vice president and manager of operations.

E. W. Englemann has resigned from his position as assistant general manager of the Utah copper division of the Kennecott Copper Corporation.

Carl W. Robertson is new director of public affairs for the White Pine Copper Company at Marquette, Michigan. He formerly was Michigan Upper Peninsula district commander of the Michigan State Police.

Professor **Clark B. Carpenter,** head of the department of metallurgy at the Colorado School of Mines, has been appointed dean of the graduate school. He will continue to act as metallurgy department head while filling the newly created position.

CECIL FITCH, JR. has been elected president of the Utah Mining Association. Mr. Fitch, who is vice president and general manager of the Chief Consolidated Mining Company at Eureka, Utah, succeeds W. G. Rouillard, manager of the Garfield plant, American Smelting and Refining Company. Other Association officers for 1953 are J. PARNELL CAULFIELD, first vice president; OTTO HERRES, second vice president; A. G. MACKENZIE, vice president and consultant; MILES P. ROMNEY, secretary-manager; and WALTER M. HORNE, assistant manager. New directors for 1953 are: L. F. PETT, general manager, Utah Copper Division, Kennecott Copper Corporation; HAROLD SPENCER, president, Centennial Development Company; and DOOLEY P. WHEELER, JR., superintendent of western exploration, AMCO Exploration, Inc.

Ross V. Seeton, mining engineer, is a new member of the exploration staff of the U. S. Atomic Energy Commission at Grand Junction, Colorado. He previously was engaged in his own mining business at Tin Cup, Colorado.

August B. Kenzel, president of research laboratories of Union Carbide and Carbon Company, is one of the American Institute of Mining and Metallurgical Engineers' new vice presidents.

H. G. Coulson, former chief engineer for Coeur d'Alene Hardware and Foundry Company at Wallace, Idaho, is now designing engineer for Moffatt Engineering Company at Albany, California.

Frank Lilly, Spokane mining man, has been appointed to the gold committee of the Colorado Mining Association. Mr. Lilly reports that the committee is currently cooperating with the banking and currency committees of the United States Senate and House of Representatives.

Jay W. Jacobson, Frank P. Williams, A. W. Clyde, M. Griffith, and **J. H. Manson** have been elected directors of the North Standard Mining Company, Salt Lake City, Utah. Mr. Jacobson was named president and general manager, Mr. Williams vice president and assistant general manager, Mr. Clyde secretary, and Mr. Manson treasurer.

CHARLES SAWYER has been elected a director of Kennecott Copper Corporation. For the past five years, Mr. Sawyer has been Secretary of Commerce. In 1944 and 1945 he served as Ambassador to Belgium and Minister to Luxembourg. He was Lieutenant Governor of Ohio in 1933 and 1934. He recently resumed his law practice as a member of the firm of Dinsmore, Shohl, Sawyer, and Dinsmore in Cincinnati.

William Richards, formerly with the Pickands, Mather & Company's engineering staff at the Biwabik and Zenith mines in Minnesota, is now employed by Western-Knapp Engineering Company.

John M. Bandel has been appointed a vice president of Electro Metallurgical Company, a division of Union Carbide and Carbon Corporation. Mr. Bandel has been assistant to **E. H. Mangan,** new Electromet executive vice president, for the past seven years and has been concerned principally with the construction of new power plants at various company properties.

John S. Hill was recently appointed manager of mining and exploration for the United States Vanadium Company. He will be in charge of maintaining ore production expansion, according to **A. P. Cortelyou,** general manager.

Pete Bria has retired after 46 years' service with the Tennessee Coal and Iron Division of United States Steel Company. At the time of his retirement, he was foreman of a crew charged with keeping the Hamilton mine free of debris.

Stephen Rodman, formerly with the Duluth office of Oglebay, Norton & Company, has been transferred to Montreal, Wisconsin as supervisor of training and industrial relations for the Montreal Mining Company.

L. W. Brady, mine foreman at Chief Consolidated Mining Company's Eureka, Utah operation has been appointed general mine superintendent to succeed **John G. Hall,** who has taken a position with the National Lead Company in Tahawus, New York.

Richard F. Moe, former general superintendent of the St. Louis Smelting & Refining Company, a division of National Lead Company, is now mine superintendent with the White Pine Copper Company at White Pine, Ontonagan County, Michigan.

William A. McIntyre is now a shift supervisor at Howe Sound Company's new $2,500,000 cobalt refinery at Salt Lake City, Utah. He previously was located at Standard Oil Company's Casper, Wyoming refinery.

Charles R. Cox, president of the Kennecott Copper Corporation, has been named chairman of the newly created Board for Development at New York University, a group created to help determine and implement the university's ten-year program for new buildings and endowments.

Bruce E. Kennedy is now district engineer on the Gogebic range for Pickands, Mather & Company. He succeeds **H. W. Johnson**, who has retired and is now living at Ironwood, Michigan.

John J. Forbes, director of the Bureau of Mines, and **Harry T. Kelsh** and **Waldemar T. Schaller**, staff members of the U. S. Geological Survey, have received gold medals for distinguished service from former Secretary of Interior Oscar Chapman.

Irvin L. Clymer, president of the Michigan Limestone Division of United States Steel Company, retired at the end of 1952, and was succeeded by **Hugh Sutherland Lewis**, who had been executive vice president of the division.

C. V. Brannen, located at Hibbing, Minnesota for many years with the International Harvester Company, has retired and moved to California. Mr. Brannen transferred to Chicago in 1946, when the Cleveland Cliffs Iron Company took over International Harvester's iron mining operations on the Mesabi range.

Dr. J. F. Haseman is a new addition to the Research and Development Staff of the Foote Mineral Company, Berwyn, Pennsylvania. As group leader of the new minerals separation division, Dr. Haseman will be in charge of a study of the field of mineral separation and processing of lithium ores and the various byproducts of Foote's King's Mountain, North Carolina and Sunbright, Virginia operations.

Robert W. Van Evera is now employed in the industrial engineering department of Calumet and Hecla Consolidated Copper Company at Lake Linden, Michigan.

Alton Gabriel has been named acting regional director of the U.S. Bureau of Mines Region VII, succeeding the late **Hewitt Wilson**. Region VII with headquarters at Norris, Tennessee, covers Tennessee, North and South Carolina, Georgia, Alabama, Mississippi, and Florida.

Obituaries

Walter L. Maxson, 60, vice president in charge of research for the Oliver Iron Mining Division of United States Steel Corporation, died on January 5 in Bellingham, Washington. Mr. Maxson was prominent in the field of taconite research, and was a consultant on the Raw Materials Committee of the U. S. Atomic Energy Commission.

Alpheus Fuller Williams, 78, former general manager for De Beers Consolidated Mining Company, died January 5 in Muizenberg, Cape Province, South Africa. Mr. Williams was the son of California mining engineer Gardner F. Williams, who opened up the diamond mining industry in South Africa with Cecil Rhodes.

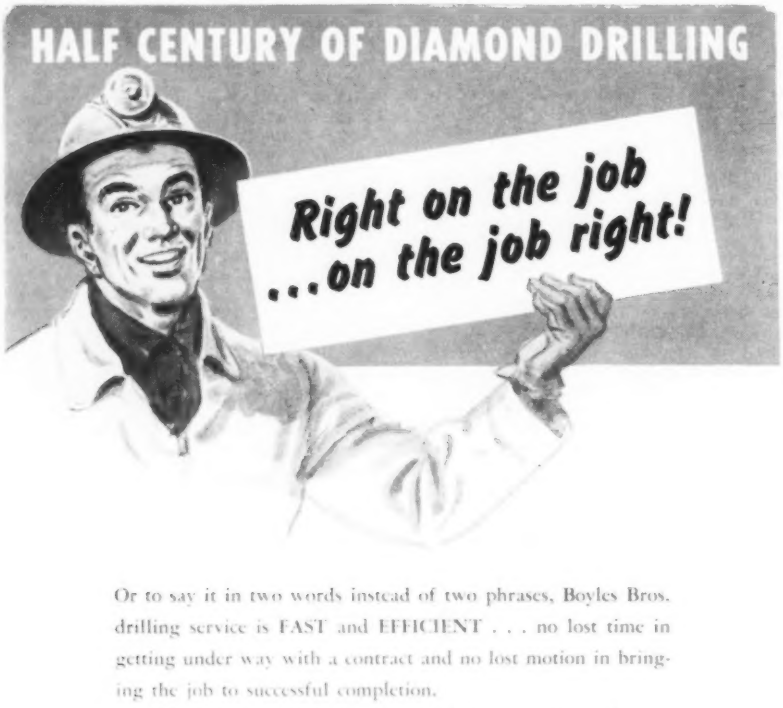
Dr. William Herbert Hobbs, ex-geologist who had twelve sections of the earth's surface named after him, died January 1 at his home in Ann Arbor, Michigan. Dr. Hobbs was head of the geology department at the University of Michigan until his retirement in 1934 and was a close friend and associate of various Polar explorers.

Dr. Charles Holmes Herty, Jr., 56, assistant to the vice president of Bethlehem Steel Company's steel division, died on January 17. He pioneered the science of the physical chemistry of steelmaking in this country, and became widely known during and after World War II for his work on the conservation of manganese and other raw materials of steelmaking.

Captain Joseph P. Hodgson, former manager of the Copper Queen branch of Phelps Dodge Corporation, died January 23 in Los Angeles, California. He had been in retirement since 1935.

William H. North, 79, secretary-treasurer of Golconda Lead Mines in Wallace, Idaho, died January 2 in Seattle, Washington. He had been associated with mining in the Coeur d'Alene district for the past 20 years, without interruption, and first came to the area at the turn of the century.

Charles J. Parry, 63, manager of the mining department of J. A. Hogle and Company of Salt Lake City, Utah, died December 8 in Salt Lake City.



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ACTIVITIES OF INTERNATIONAL MINING MEN

JACK WHITE, the man who discovered Australia's most promising uranium deposit at Rum Jungle, 54 miles south of Darwin in the Northern Territory. He had been prospecting in that state for more than 20 years. In 1952 he received his first installment of £A 8,000 against his reward of £A 25,000 for the discovery.

Mario Sanjines Uriarte is new director of the Banco Minero de Bolivia, government agency which directs the recently nationalized mines. The former head of the ministry of mines succeeds **Manuel Barrau,** who also is president of the Mining Corporation of Bolivia.

William Addison Freeman, president and chairman of the board of directors of Bulolo Gold Dredging, Limited, has resigned because of ill health. The firm operates in New Guinea.

Earl G. Schulz and family have returned to McGill, Nevada after spending a year at Murgul, Turkey. While in Murgul, Mr. Schulz acted as consulting copper metallurgist for Murgul Baker Isletmesi, operating firm for Eitbank's copper mine and smelter and producers of 10,000 tons of blister copper annually. The American metallurgist will again work for Kennecott Copper Corporation's Nevada Mines Division.

Joe Peterson, vice president and general manager of the Consolidated Mining Company, Philippine Islands, has resigned and returned to the United States. Mr. Peterson, who also directed Consolidated's subsidiaries, Balatoc Mining Company and the Consolidated chromite mine, will be succeeded by former general superintendent **Ralph Crosby. A. P. Davidson,** formerly general superintendent at Masinloc, moves into Mr. Crosby's job.

Robert J. Hundhausen and **Horace T. Reno,** mining engineers from the U. S. Bureau of Mines' Spokane office, have been temporarily assigned to a nickel drilling project at the Nicaro mine in Cuba. The project is under the direction of the Bureau's chief mining engineer, **E. D. Gardner.**

Ivar Hesslund of Sweden has been appointed visiting Professor at the Louisiana State University, Baton Rouge, Lousiana.

Hugh Murray, general manager of Mount Lyell Mining and Railway Company, Ltd., Queenstown, Tasmania, is a member of Australia's newly appointed Atomic Energy Commission.

T. R. Cupery, previously associated with the Technica University Mining Department in Delft, Holland, has accepted a new position as mining engineer with the Dutch State Mines.

R. J. Westwood, former cyanide manager of the Randfontein Estates Gold Mining Company in South Africa, is now consulting metallurgist for the Johannesburg Consolidated Investment Company, Limited.

Francis J. McGuinness of Australia and **K. O. Skejerdal** of Norway have been elected chairman and vice chairman, respectively, of the International Materials Conference. They succeed **W. E. Taylor** (United Kingdom) and **Augustin Ochoa** (Mexico).

Claude W. Gourand is in charge of the Regional Office No. 2 of the Defense Materials Procurement Agency, which was recently opened in Lima, Peru. This office will cover all South America except the Guianas.

K. Iwamoto, S. Terui, and **Minoru Fucuda** were recent visitors at the phosphate division of International Minerals and Chemical Company in Florida. Mr. Iwamoto and Mr. Terui are officials of the Japan Hydrogen Company, and Mr. Fucuda is associated with **K. Tsuji,** of International Minerals' Tokyo sales staff.

L. M. Abell, former mill superintendent for Emperor Mines, Ltd. of Vatukoula, Figi Islands, is now mill superintendent for the Cyprus Mines Corporation at Skouriotissa, Nicosia, Cyprus.

E. Perkins, executive of the Mutual Chemical Corporation in New York, recently returned from a trip to Transvaal, where he inspected chrome mines. Since all chemicals made from chrome in the United States are derived from Transvaal ore, Mr. Perkins said he was pleased to find that these ore reserves are larger than the total output of the rest of the world and sufficient to meet the requirements of the next 200 years.

A. RUSSELL MERZ and ALLEN H. ENGELHARDT have been appointed vice presidents of Cerro de Pasco Corporation. Mr. Merz will supervise the company's sales and purchases at its main offices in New York, while Mr. Engelhardt will continue to manage the company's metal mining, smelting, and refining operations in Peru with headquarters at La Oroya. Mr. Merz has been with Cerro de Pasco since 1945. He was previously associated with the Tin Processing Corporation of Texas and Anaconda Copper Mining Company. He also spent a number of years in Northern Rhodesia in charge of metallurgical operations at Roan Antelope and Mufulira. Mr. Engelhardt was with the South American Development Company for 20 years, his last position being vice president and resident manager in Ecuador. He joined Cerro de Pasco in 1950 and has been manager of operations.

DR. EDMUND C. HARDER, senior geologist for Aluminium Limited, Montreal, has been appointed a member of the company's board of directors. Internationally recognized as a leading authority on the geology of bauxite and other minerals used in aluminum production, Dr. Harder has directed bauxite exploration on every continent during his 32 years in the industry. He has been with the Aluminium group since 1928.

Augusto Cabrera de la Rosa has been appointed director general of Peru's Instituto Nacional de Investigaciones y Fomento Minero. He succeeds **Dr. J. A. Broggi,** who resumes his post of director of the Institute Geologico del Peru.

A. L. Irwin has been appointed to the newly created position of manager of the purchasing division of The Consolidated Mining and Smelting Company of Canada Limited. His new post embraces the responsibilities of purchasing agent, the position he previously held. Mr. Irwin, a metallurgical engineer, has been engaged in Canadian mining since 1922. Other changes in Cominco personnel include the retirement of **E. M. Stiles** as chief engineer, the promotion of **J. V. Rogers** to the new position of manager of the engineering division, and the advancement of **W. K. Gwyer** to the new post of assistant manager of the engineering position. Mr. Stiles is now a consulting engineer, engineering division.

V. Gorsky is now a consulting mining engineer and metallurgist in South Africa. He may be reached at 63 Jellico Avenue, Melrose via Johannesburg, South Africa.

J. F. van Kersen, geologist, is working on his doctoral thesis under the auspices of the Surinam Welfare Fund and the Surinam Geological and Mining Service.

J. P. Wiseman has been elected president of Fluor Corporation of Canada, Ltd. and **John G. Marshall** is new vice president in charge of engineering. The Canadian firm is a subsidiary of Fluor Corporation, Limited, of Los Angeles.

P. J. Muysken has been engaged as concentrator foreman by the Cerro de Pasco Corporation at Morococha, Peru. He formerly was located in Bolivia.

J. D. Crawford was recently elected vice president and general manager of Alaskan operations, U. S. Smelting, Refining and Mining Company.

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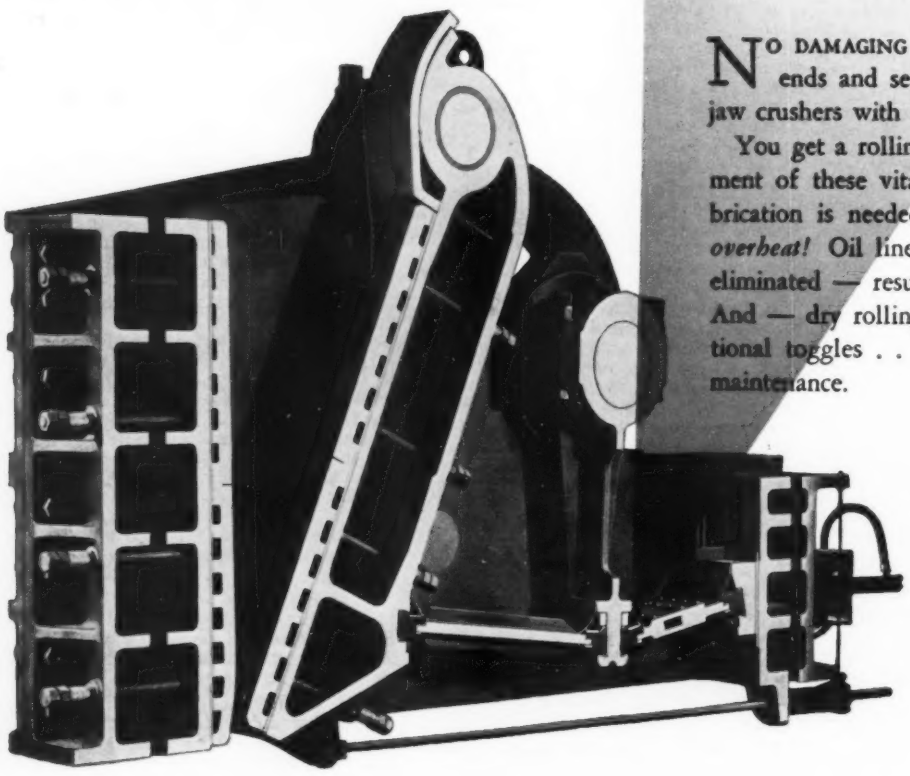

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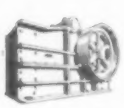
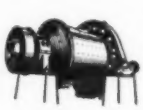


Jaw Crushers

Gyratory Crushers



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INTERNATIONAL NEWS

UNDERGROUND EXPLORATION CONDUCTED ALL WINTER AT GREENLAND DEPOSIT

Greenland's first all-winter underground exploration program is being conducted along the east coast where Nordish Mineselskab A/S (Nordic Mining Company, Ltd.) is determining the mine-making possibilities of the Blyklippen lead-zinc deposit. A 50-man crew is at work under the director of W. J. Tough of Ventures, Ltd. who has been named Canadian manager of the company.

During the 1951 season, an adit was driven about 300 feet, and crosscutting and diamond drilling brought the explored length of 900 feet, open at both ends. Development muck averaged about 22 percent combined lead and zinc. This winter a second adit is being driven to provide a total of 450 feet of backs. The new adit is going in about 300 feet below the original adit to check the previously indicated material.

A permanent camp, including housing accommodations and office buildings,

was constructed during the summer by a crew of 100 men. An airstrip was completed so that the camp could be serviced through the winter. Planes fly from Denmark to Mesters Vig, refueling enroute at Reykjavik, Iceland. A 10-mile truck road runs from Mesters Vig to Blyklippen.

Winter conditions in the Blyklippen area are similar to those in the Northwest Territories of Canada where mining goes on year-round. Temperatures seldom fall below 40 degrees below zero in winter, and rarely rise above 50 degrees above zero in summer.

Nordish Mineselskab A/S was formed by capital from three nations. The Danish government contributed 27½ percent, Danish companies 27½ percent, and two Swedish concerns and one Canadian firm also participated. The Swedish firms are Bolidan Gruvaktiebolag and Store Kopparbergs Bergslags Aktiebolag. The Canadian firm is Ventures Ltd. which has a minority interest.

Premium Brings Colombian Gold Price to $47.00

By a recently enacted governmental decree, all newly produced gold in Colombia will be paid for at the official price of $35.00 per ounce, plus a premium of 30.00 Colombian pesos per ounce, or a total of $47.00 per ounce. Prior to this action, a premium of 12.00 pesos per ounce had been paid for newly mined gold.

The Colombian Association of Miners is paying the premium. The Association exports fabricated gold and receives certificates of exportation in exchange. These certificates permit the importation of articles on the prohibited list of importations, and are sold to importers on the legal open market at prevailing prices. This represents about 40 percent over and above the official exchange rate, with profits from these sales going to the fund from which the production premium is paid.

During the period of 1936 to 1947, when gold production was at its maximum in Colombia, the official rate of exchange was 1.75 pesos per dollar. Today's official exchange rate is 2.50 pesos per U.S. dollar. The new price of gold as now established (117.50 pesos per ounce) is 93 percent higher than the price prevailing during that boom period (61.25 pesos per ounce).

Five Canadian Firms Merge To Form Cobalt Company

A new Canadian mining firm, Cobalt Consolidated Mines, Ltd., has been formed from the assets of Cobalt Lode Silver Mines, Ltd., Penn-Cobalt Silver Mines, Ltd., Gilgreer Mines, Ltd., Hellens Mining & Reduction Company, Ltd., and Silanco Mining & Refining Company, Ltd.

The new company will be capitalized at 3,500,000 shares, 2,175,000 of which will be issued under the consolidation.

Silanco is retaining its Violet and Beaver mines and its large stockholdings in Cobalt Chemicals, Ltd. It will also become the principal stockholder in Cobalt Consolidated, receiving a total of about 650,000 shares.

Total assets will include the Aguanico cobalt-silver mine, the Cobalt Lode silver mine, the Hellens tailings treatment operation, the nearly completed Penn-Cobalt 200-ton-per-day mill and mining operation, and the Gilgreer mine. The new cobalt vein at the Aguanico mine now shows 700 feet of ore, while the Hellens tailing mill has been operating for some time at the new high rate of 600 tons daily.

Australian Firm Appointed Agent For Rum Jungle

Territory Enterprises Proprietary, Ltd., newly-formed subsidiary of the Zinc Corporation, Ltd., recently was appointed agent for the Rum Jungle uranium field by the Australian government.

The company will also control part of an area recently covered by an aerial survey which is known to contain promising uranium fields.

First step will be to construct a modern township to accommodate several hundred mine workers, while preparing for large-scale mining at the same time. A company expert will fly to the United States in the near future to get full details on the uranium treatment plant, for which no date has been set to start operations. A considerable number of company experts have already arrived in Rum Jungle, and the company has set up an office.

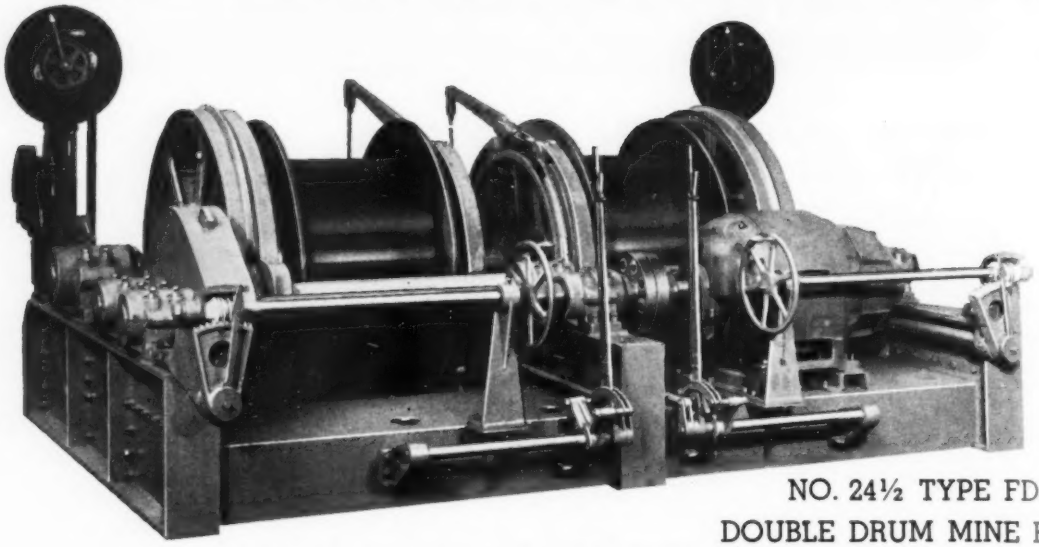
Surplus output from the area will be marketed exclusively to the United States and Great Britain under the terms of a new ten-year contract. In exchange, the two latter companies will provide for cooperative development in both surveying and exploitation of the deposits.

Rhodesia Firms Improve Native Living Conditions

Four large copper mining companies in Northern Rhodesia made public recently a plan for improvement of native workers' housing and living conditions during the next five years. The program, which will cost £2,000,000, covers improvement of fittings and fixtures in both married and single quarters, extension of individual sanitation arrangements, larger houses for the bigger families, additional parks, children's playgrounds and recreational facilities, extended health and welfare service for workers' families, and improved education and cultural facilities.

The four companies—Mulfulira Copper Mines, Ltd., Nchanga Consolidated Copper Mines, Ltd., Rhokana Corporation, Ltd., and Roan Antelope Copper Mines, Ltd.—made the decision following a review of native social life on the mines of the copper belt which showed that considerable progress had been made by native employees in adjusting themselves to semi-urban conditions. In addition, the companies have agreed to the installation of electric lighting in all native houses at an estimated expenditure of £500,000.

VULCAN-DENVER



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ASARCO TERMINATES NIGERIAN OPTION AFTER LENGTHY LEAD-ZINC EXPLORATION

The American Smelting and Refining Company has terminated its option on the 400-square-mile, lead-zinc property it has been examining for the past few years at Ogoja near Abakaliki in eastern Nigeria.

ASARCO had a lease and profit-sharing agreement with the Mines Development Syndicate (West Africa) Limited under which ASARCO would finance exploration and development along with the cost of placing the property on an operating basis if a commercial deposit were proven. Exploration extending over the last 30 months has indicated a fair tonnage of lead-zinc ore, but the size of the deposit would appear to support only a small-scale operation which would not be of interest to the American Smelting and Refining Company.

Small-scale mining for lead and zinc has been done in the Abakzaiki Abakaliki, Zurak, and Arufu region since 1885. Production through 1949 was about 10,000 tons of lead concentrate and 1,000 tons of zinc. Lead and zinc minerals are found in fracture fillings in veins cutting a series of Cretaceous sedimentary rocks. Veins are lenticular in habit, and generally less than eight feet wide. Type of wall rock apparently is of importance as it affects size and type of vein with the widest veins occurring in the finer grained sediments. A number of nearly parallel veins form fractured or sheeted zones with widths up to 50 feet and several are known to have a length of at least one mile. The mineralization has been found in a narrow belt almost 350 miles long striking northwest with the town of Abakaliki near the southern end.

M. E. Newlove was managing director of operations for the Nigerian Lead Zinc Mining Company which was the exploration company. He went to Nigeria from Leadville, Colorado, where he had been manager of the Resurrection Mining Company.

Glidden Aids In Erection Of Japanese TiO_2 Plant

A $6,000,000 titanium dioxide plant, the largest of its kind in the Orient, will be built by the Ishihara Chemical Company midway between Tokyo and Osaka, Japan. The Glidden Company of Cleveland, Ohio will provide technical assistance for large-scale production of the pigment.

Under an agreement signed by the two firms, Ishihara has been licensed to use Glidden processes and methods. Glidden will receive a down payment, royalty payments over a period of years, and rights to any new processes developed at the new plant. Production is expected within a year.

Ishihara is engaged in copper and ilmenite mining, sulphuric acid production, and the operation of steamship lines. Since the raw materials are sulphuric acid and ilmenite, the Japanese firm is considered ideally qualified to produce titanium dioxide.

Pyrite Deposit Uncovered By Construction Project

A deposit of iron pyrite was uncovered in Israel recently while constructing the Belt Natufa Dam in Galilee. Scientists of the Technological Institute of Haifa are investigating to determine whether the deposit is large enough to justify commercial development.

A large pyrite find could replace imports from Greece which will begin soon for the new sulphuric acid plant being built by Chemicals and Fertilizers, Ltd. at Haifa. The plant will use phosphates from Negeb. As of August of last year, the quarries southeast of Beersheba had produced more than 10,000 tons of phosphate rock, and this is expected to be increased to 80,000 by the end of this year.

This pyrite find is the latest in a series of discoveries that indicate a bright future for Israel in mineral resources. A new mineral survey, more intensive than any to date, is now being undertaken in Negeb. The government is supplying technical aid and equipment for the research.

Colombian Volcano Proves New Sulphur Source

A modern mill and plant to produce sulphur from a bed of lava breccia has been installed by Industrias Purace S.A. about two miles from the active crater of Purace volcano east of Popayan, Colombia.

The new mill, with a capacity of 100 tons of ore per 24 hours, will produce 30 to 35 tons of 97.7 percent pure sulphur daily. The mill circuit consists of jaw crushing to ¾-inch size, and ball milling to minus-28-mesh. This is followed by a continuous steam-operated autoclave for sulphur recovery, the tailings of which are passed through two flotation units for final sulphur extraction. The tailing is then thickened and discarded with the thickener overflow being returned to the ball mill. The autoclave and flotation products are filtered and bagged in 50 kilo sacks for transportation by truck.

All ore is mined from an undulating seven-meter-thick, volcanic breccia bed, which averages 40 percent sulphur. Mining is carried on systematically using a top heading and bench and room and pillar stoping as used in the Tri-State district of the United States. Drilling is done by jack-leg-mounted jack hammers. The broken ore is loaded directly onto ordinary motor trucks by an overhead swing, crawler-mounted, loader for direct transportation to the mill. No timbering is required.

While the operational "bugs" are eliminated from the new plant, the company is continuing to produce sulphur from its old plant which produces 10 tons per day by means of three manually charged and operated steam autoclaves. Truck-transported coal is used for steam generation, and all electric power is produced by Diesel motor generators.

Metal and Ore Exports from Belgian Congo and Ruanda-Urundi in First Nine Months of 1951 and 1952

Commodity	*First Nine Months 1952*	*First Nine Months 1951*
Cadmium[1]	31,900	43,096
Cobalt granules[1]	5,544,904	4,290,469
Copper-cobalt alloy[1]	14,881,138	11,331,115
Copper[2]	154,705	141,215
Tin ingots[2]	2,115	1,914
Tin concentrate[2]	12,159	10,661
Manganese ores[2]	86,156	49,287
Tantaliferrous slags[2]	669	4,817
Tantalum-columbium concentrates[2]	184	153
Tungsten concentrate[2]	611	371
Zinc concentrate[2]	67,350	88,692
Zinc concentrate (roasted)[2]	44,131	38,395
Zinc metal[2]	30	—

1. Pounds 2. Long tons.

British Steel Production Gain Expected to Continue

Steel production in Great Britain is rising sharply. Production for 1952 is expected to total about 16,000,000 tons, while estimated production this year (1953) is put at 17,500,000 tons.

Steel allocations have been substantially raised for the first quarter of 1953, and it is expected that the steel allocation scheme will end shortly. The freeing of steel will result in substantial increases in British production of capital goods, heavy machinery, and throughout the metal-using trades. This, in turn, should result in a greater demand for nonferrous metals, especially nickel, cobalt, copper, lead, and zinc.

The steel industry's five-year expansion plan, started in 1946 and estimated to have cost £300,000,000, is resulting in many more blast furnaces coming into production and a much greater use of iron ore in place of scrap. Largest increases in production are coming from the new plants in South Wales of the Steel Company of Wales; in Lincolnshire, England, where the new melting shop at the Appelby-Frodingham works has added to capacity; and in Staffordshire.

Soviet Iron Production Due For Big Expansion

The Soviet Union is planning further development of iron ore deposits and will build new metallurgical plants in the Trans-Caucasus, the Karelo-Finnish Republic, the Donetz Basin, the Urals, Siberia, and the Northwest, according to Tass, Soviet state news agency.

Tass also quoted from an article by Pavel Korobov, Soviet Deputy Minister for Iron and Steel, in which he said that pig iron production in 1955 would be 76 percent greater than in 1950, steel would be 62 percent more, and rolled metal upped 64 percent.

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QUEBEC'S BARVUE MAKES MINE HISTORY
Record Plant in Barraute Operating in Record Time
The largest initial milling and concentrating plant ever put up in Canada — that of Barvue Mines Ltd. — is rolling to achieve production of 4,000 tons a day. The goal was expected to be reached this week.
THE STAR
VAL D'OR · BOURLAMAQUE · MALARTIC · PERRON · CADILLAC
Page 17
Vol. VI — No. 39
VAL D'OR, QUE., FRIDAY NOVEMBER 28, 1952
So You're Opening A Mine, Y
--2,750
Come

The Largest Initial Milling and Concentrating Plant Ever Put In Operation in Canada

Barvue Mines Limited, near Barraute, Canada is Quebec's largest base metal producer. The Barvue mill handles 4,000 tons of ore per day and the No. 48 Agitair rougher cells play a vital roll in the production of 200 tons per day of 60% zinc concentrate. Expansion plans for the immediate future include an iron pyrite section that will boost production another 250 tons per day and require additional banks of No. 48 Agitair machines.

It takes highly efficient metallurgy to deliver this premium grade product at Barvue. Agitair — rugged, reliable, flexible—stays continuously on the job, delivering at a high rate of recovery with low reagent and power consumption and minimum maintenance. Here, as in other operations throughout the world, Agitair meets the exacting requirements of the progressive streamlined mill. One more proof of the undisputed leadership of Agitair.

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Agents In All Principal Foreign Mining Districts

LATIN AMERICA

BOLIVIA—The specific locations of the concessions assigned to Glenn McCarthy, Texas oil man, to mine Bolivan sulphur have now been revealed. The zones or mines granted to him are the Ollague-Topilla, Serranias Napa-Caiti, Serranias Canapa-Caquella, and Serranias Apaga-do-Laguna Colorado. All are in the provinces of North or South Lipez in the Department of Potosi. Under terms of the $3,000,000 contract, the Bolivian government will receive eight percent royalty on the gross value of exported sulphur. (See *Mining World*, November 1952, p. 59.)

VENEZUELA—Diamond output for the first eight months of 1952 outstripped the total annual production of all years, with the exception of 1948, and this was expected to be surpassed by the end of 1952. The large increase is attributed to partial mechanization of diamond mining and to the new zones under free exploitation. Until recently, the search for diamonds had been conducted with the most primitive of methods. Diamond deposits are found in Bolivar State, in the regions of the upper and lower Caroni, the Paragua River, and at Icabaru. The richest deposits are around Peraitepui in the upper Caroni on the Gran Sabana. Here the *Venezuelan Diamond Company* has invested more than $1,000,000 in equipment, and large-scale operations have given good results. Total production for the country during the first eight months in 1952 totaled 68,005 carats, compared with only 39,642 carats in the previous year.

MEXICO—A $3,600,000 loan has been approved for the *Hoja Lata Ye Lamina, S.A.* by the Export-Import Bank. The money will be used to expand the firm's steel mill at Monterrey, Mexico. New facilities include an electric melting furnace, a hot strip mill, continuous pickler, cold strip mill, strip cleaning line, annealing furnace, tempering mill, and shearing and coil slitting lines. They will increase the compay's annual finishing capacity from 30,000 tons to about 50,000 tons. Hoja Lata Ye Lamina is one of a group of industries originally established to supply the needs of the parent company, *Cerveceria Nuauhtemoc*, S.A. The loan comes from the $150,000,000 authorized August 31, 1950 by the bank.

BOLIVIA—Following signing of an agreement with the *United States Reconstruction Finance Corporation* for the purchase of 5,000 tons of concentrates from Bolivia, talks are continuing between the two governments. Discussion is said to center around two items: compensation for United States stockholders in *Patino Mines and Enterprises Consolidated*; and a one-year contract for the purchase of more concentrates by the RFC. Negotiations are reportedly slow because the Bolivian Ambassador must cable his government for official instructions after each conference.

COLOMBIA—The large steel mill being built by *Empresa Siderurgica Nacional de Paz de Rio, S.A.* is scheduled for completion by the end of the year. Initial capacity will be 100,000 tons of finished products, with eventual expansion planned. Raw material deposits are

For each type of mixture, parts of different alloys . . . . . .

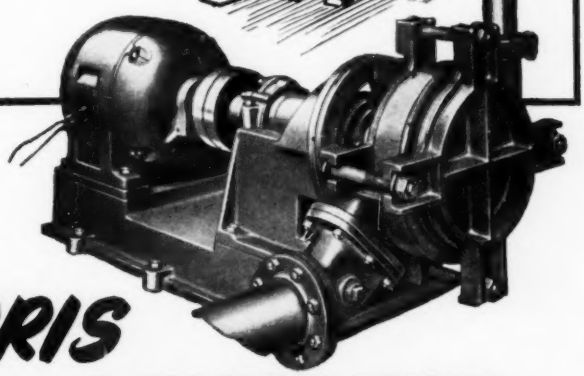

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Illustration above is from World's Greatest Open-Pit Copper Mine at Chuquicamata, Chile

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REPRESENTATIVES IN PRINCIPAL MINING CENTERS IN THE UNITED STATES AND OTHER COUNTRIES

g developed about 22 miles from the
site. The project was started fol-
ng a survey made by the *Koppers*
pany, Inc. of Pittsburgh, Pennsylva-

ENEZUELA—*Orinoco Mining Com-*
is two months ahead of schedule
s dredging of the Macarea channel
he Orinoco River. To date, 15,318,-
cubic yards of mud and silt have
removed, completing 56 percent of
operation. The contract calls for final
pletion of dredging by November

RAZIL—The firm of *Sobramil* has in-
ed $35,000,000 in a fleet of vessels
ch will carry manganese from the
cum mines down the Paraguay
er. Annual exports are expected to
unt to 300,000 to 500,000 tons of
The estimated reserve is about 34,-
,000 metric tons of manganese ore,
an average content of 46.5 percent
nganese.

HILE—The Chilean government has
n accused of shipping materials
ed in Chilean warehouses by Boliv-
mining companies to Bolivia against
wishes of the owners. A court order
ained in the Chilean courts stopped
e shipments but they were later re-
ed over the protests of the owners
en the courts recessed. The compa-
involved—*Patino Mines and Enter-*
es Consolidated, Mauricio Hochschild
A.M.I.), and *Cie. Armayo de Mines*
Bolivie—were nationalized by Bolivia
October, but the expropriation decree
said to have excluded assets which
e outside of the Bolivian frontier.

ARGENTINA—The province of Men-
a has entered into an agreement with
national government for mining and
drogeological affairs. Mendoza will
vide $500,000 annually for certain
jects. Several investigations are cur-
tly under way in Mendoza. In the
ntal Range, a preliminary study has
rted in an attempt to make a geologi-
survey of this zone. In the arid zone
Lavalle, investigations are being made
the Mirabilite deposits (Na_2SO_4),
d the geologic mapping of this zone is
ing completed. The state is reported
rank first in the output of talc with
mines in operation—three in Uspal-
ta, two in Bonilla Range, and one in
unuyan.

BRAZIL—An agreement has been
gned with the Japanese firm *Sumitomo*
sell 5,000 metric tons of aluminum to
e Brazilian aluminum industry. At
esent, Brazil produces only 2,000
etric tons and consumption is about
5,000 metric tons annually. However,
the end of 1956 the country will be
oducing 12,000 metric tons; 22,000 in
958, and 32,00 in 1960. Current out-
ut is from *Usina Saramenha* operated
Eletroquimica Brasileira S.A. The
sina de Aluminio, owned by *Compan-*
ia Brasileira de Aluminio, will be re-
sponsible for the largest part of the in-
eased production.

ARGENTINA—A geological survey has
en made in the province of San Juan
a technician of the Litoral University.
e reports that there are two zones of
ining importance in this area. In the
rst zone, Pie de Palo, nickel occurring in
rpentine is considered promising. Zonda
hico was the second area investigated.
he report also recommends a study of
road conditions, reduction of railway freight rates, and utilization of hydro-electric energy.

MEXICO—Discovery of a large sulphur deposit near San Cristobal, Vera Cruz, has been reported by the *Ministry of National Economy*. The deposit is located on property worked by *Cia. Azufrera Mexicana, S.A. (Mexican Sulphur Company)*. Company and Ministry engineers are now calculating the quantity and grade of the deposit, said to be one of the largest ever found in Mexico. The sulphur reportedly comes to the surface naturally with ordinary drilling and does not require the use of the Frasch Process. Three treatment plants are planned for the area. It is also reported that *Gulf Sulphur Company* has discovered a sulphur deposit at Jaltipan, Vera Cruz, where it is currently operating. Preliminary estimates evaluate this deposit as having a 350,000-ton annual output potential. A treatment plant is being installed at Potrerillos.

BOLIVIA—*Corporation Minera de Bolivia* has been advertising in Swiss and German newspapers in an attempt to hire mining specialists since most of the foreign specialists have left the country since the recent nationalization of the mines. For specialists working in the dollar areas, Bolivian pay which is not yet assured is hardly attractive. For miners on the job, retroactive wage increases are now being paid amounting to 500,000,000 Bolivianos. Dismissal entitles miners to indemnification pay. If a miner has worked one year for a company, his indemnity would amount to 25 days. For that, the average wage over the last 75 days would be taken. It has not yet been decided whether this payment will be in cash. The corporation suggests 10 percent cash and 90 percent on a savings account.

CUBA—The *Nicaro* nickel plant, reopened a year ago, is now producing at the rate of more than 1,000 tons per month. The huge government plant built by the United States during World War II was closed down in 1947 as a surplus operation. It went back into partial production in January 1952 and was restored to full operation by the middle of the year. By the close of the year it produced about 17,500,000 pounds of nickel and cobalt. This does not represent its annual capacity, however, since the plant was not operating at full capacity for the entire 12 months.

COLOMBIA—With the help of a group of French capitalists, the country is reportedly building a steel plant which will have an annual capacity of 100,000 metric tons.

SOUTH AFRICA—*O'okiep Copper Company, Ltd.* reports that it earned $5.26 per share during the last six months of 1952, compared with only

PROSPECTING IN THE WILDS OF MEXICO

Currently prospecting in the areas of Quieriego Sahuaripa, Bocoyna, Guazapares, and Chinipas in the provinces of Sonora and Chihuahua, Mexico, is David McClelland who is pictured above (second from the right) with a group of tungsten placer miners near the Yaqui River. Mr. McClelland reports that Chinipas is now a mining ghost town, 99 percent of it in ruins. The only entrance is by mule train and make-shift air strip. Within one day's mule ride, three 20-ton mills are in operation—at San Juan de Dios under the management of Samuel Slack; at Guazapares under Wallace Tinney; and at Todos Santos under Pedro Herran. These mills produce an average of 450 kilos of concentrates per day valued at approximately $750. A four-wheel, deep-drive road connects these plants with Creel, Chihuahua. All have radio communication, and make use of the landing strip near Guazapares at 6,500-feet altitude. One of Chinipas' larger operations in the past was that of the Palmarejo and Mexican Gold Fields Ltd. which was forced to suspend operations because of the Mexican Revolution of 1912. The Palmarejo group is reportedly still intact with a large reserve of ore. A few natives now live at Palmarejo eking out a small existence taking out high-grade ore (as much as 1,200 ounces of silver per ton) which they sell to local mills for reduction.

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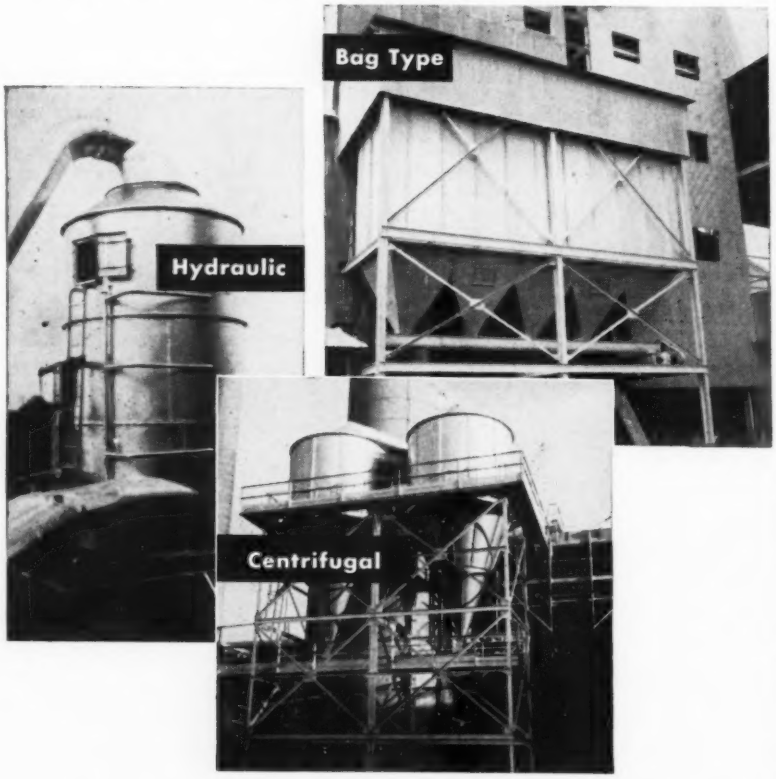
engineered collection equipment . . .



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$3.69 per share during th same pe in 1951. The increase is attributed the high world price for opper w averaged 31.75 cents per p nd in 19 as compared with only 2 26 cents 1951. Total net profit afte axes for period ended December 31 was $5,7 441, compared with $3,769 58 in 19 The firm is currently build g a 200-t per-day tungsten plant thr miles fr the copper mill. *Newmont Mining C poration* owns 56.3 percent of Osko stock.

NORTHERN RHODESIA–Over th last several months, *N'changa Consol dated Copper Mines* has bee produci more copper than any of the other thr mines in the Northern Rhodesian Copp belt. Tonnage of ore treated is ver much less, but this is accounted for b the higher grade of ore. At prese 180,000 tons of ore are being mine monthly, from which about 10,000 ton of copper are obtained. The mine ha two major orebodies: Nchanga We currently being mined, which contain 4,700,000 tons of 7.0 percent coppe and another orebody with an estimate reserve of 90,000,000 tons containing 3 percent copper. The two reserves to gether represent a total tonnage of re coverable copper exceeding 4,500,00 tons. Expansion plans will increase th amount of ore mined but not necessarily the amount of copper since some of the lower grade ore will be treated.

SOUTH WEST AFRICA–*Industrial Diamonds of South Africa (1945) Ltd.* has delayed opening of new mines in the Diamond Area No. 2 because of heavy overburden and the influx of water over the marine terrace. New methods of mining this area are now being investigated. At Meob Bay, terraces have been located but so far only surface diamonds have been found. Systematic prospecting is being conducted to discover the deposits from which these surface diamonds originated.

NIGERIA–A. Hedley Williams, chairman of *Ribon Valley (Nigeria) Tinfields, Ltd.*, reports that a recent visit to the company's concessions impressed him favorably. The reserves at Vom and Kwall were 714 tons, averaging 0.52 pound per cubic yard. A trial paddock was started at Sabon Gida and here tin reserves were 2,391 tons. Mechanical conveyors are being considered for use since labor is scarce, particularly in the farming season. Current output for the eight months ended in November was 69 tons, compared with only 47 tons in the same period of 1951.

UNION OF SOUTH AFRICA–Good progress has been made with the program of expansion at the *Rustenburg* mine of *Waterval (Rustenburg) Platinum Mining Company, Ltd.* Production at both the Rustenburg and Union sections has been increased, and, while some additional work is necessary at the Rustenburg section, the Union section is operating at the full capacity of the expanded plant. The combined capacity of the two sections of the mine is at present about 110,000 tons per month and this rate of milling is now being achieved. The final stages of expansion should be completed shortly and there will then be a small further increase in milling capacity. A new company, *Matte Smelter (Proprietary) Limited*, has been formed to erect and to operate a plant at Rustenburg for the preliminary treatment of part of the increased output of matte. The plant is expected to go into operation during the second half of 1954.

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BELGIAN CONGO—For the year ended June 30, 1952, *Geomines (Cie. Geologique et Miniere des Ingenieurs et Industrials Belges)* produced 3,576 tons of cassiterite, of which 532 tons were obtained from hard rock. In the same period of the previous year, production totaled 3,820 tons. The new hard rock section has been steadily opened up and important preparatory work is being carried out. Production of tin for 1951-52 was 2,503 tons. Other production figures were 110 tons of tantalite-columbite and 900 tons of tantalite bearing slag. During the succeeding five months of that year, 1,620 tons of cassiterite, 45 tons of tantalite-columbite, and 400 tons of slag were produced toward an estimated annual production of 4,200 tons of cassiterite, 120 tons of tantalite-columbite, and 1,000 tons of slag. This represents an increase of about 18 percent. Any further increases will be dependent upon completion of the new turbines of the central power station due in 1956. When completed, the company expects an annual output of between 7,000 and 8,000 tons of cassiterite.

SOUTH WEST AFRICA—Tantalite-columbite has been discovered in many of the tin-bearing pegmatites controlled by *Uis Tin Mining Company (South West Africa) Limited*. Two large pegmatite bodies on the claims purchased by Uis south of its tin min[e] have tanta-lite-columbite as the main [ore] miner[al] and are said to be the lar[gest] found [in] South West Africa to date. [Tests are be]ing conducted to establish t[he] best met-ods of extraction. The exist[ence] of lit-ium minerals and beryl ha[s] also been found in some of the pegmat[ites].

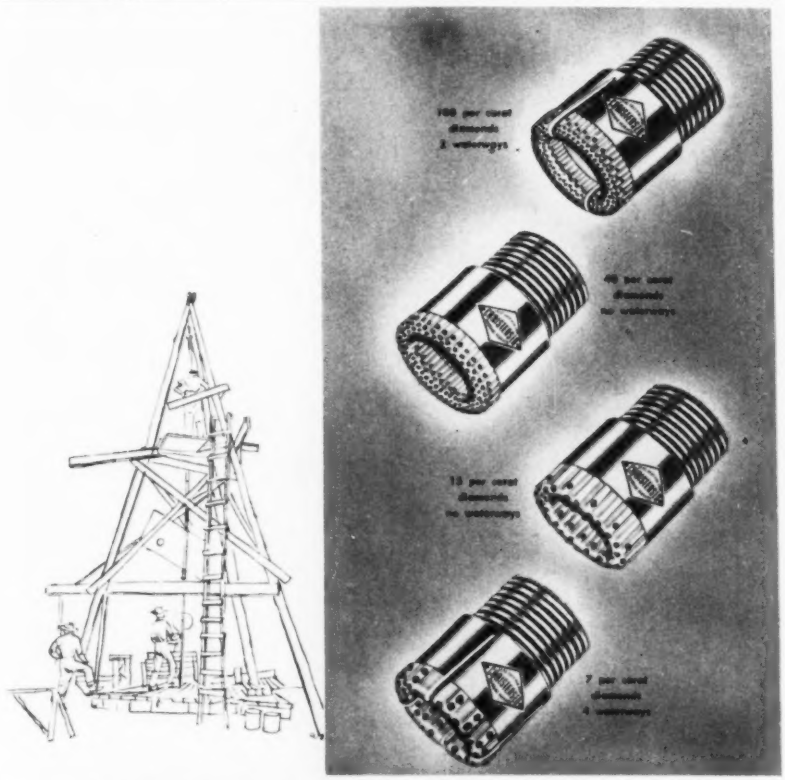
SOUTH AFRICA—Drilling at the *Letaba* copper and zinc mine of *Amer-can Anglo-Transvaal Investment Corp-ration Ltd.* has disclosed promising val-ues in two of the boreholes. The sinking of No. 2 shaft to its final depth of 36[00] feet has also been completed, and de-velopment to prove the orebody is con-tinuing from both the No. 1 and No. 2 shafts. The company has also partic-pated in the initial financing of a new company, *Hartebeestfontein Gold Min-ing Company, Ltd.*, to mine an area of 4,889 claims adjoining the *Stilfontein* mine in the Klerksdorp district. The *Anglo-Transvaal Consolidated Invest-ment Company, Ltd.* has sponsored the formation of the new firm.

SOUTHERN RHODESIA—*Coronation Syndicate Ltd.* has extended the com-pany's activities beyond gold mining by accepting a 50 percent interest in the *Ratanyana Asbestos Venture* located be-tween Gwanda and the Limpopo River. A three-year option was acquired by the *London and Rhodesian Mining and Land Company* to acquire these claims. Meanwhile, diamond drilling has been going on on the 14th level of the *Arc-turus* mine. A crosscut has been driven through reef matter which was encoun-tered at 10 feet in extending to 30 feet. Results show an average of 6.5 dwt. over a true width of 197 inches. Driving on this reef is now in progress and de-velopment work to test the reef on the levels above will be carried out soon.

SIERRA LEONE—Exports of iron ore to Great Britain have amounted to 54 percent of total shipments. The United States receives 20 percent, Germany 21 percent, and the Netherlands 3 percent. The *Sierra Leone Development Company, Ltd.* is developing the *Marampa* deposit on a 99-year lease negotiated be-fore the war. Legislation provides for the construction of a private railway and for a loan from the Colonial Development Fund. The company also has a 99-year lease covering the *Tonkolili* deposits and is now considering their develop-ment.

GOLD COAST—*Nanwa Gold Mines Ltd.* has ceased underground mining op-erations and is now mining and treating surface ores. At today's costs, the deep ore body in its present state of develop-ment was not a paying proposition. In the first eleven months of 1952, the mine failed to pay its way by about £31,000. Deficit was made good out of capital. Returns from the mine for November showed 3,400 tons of ore milled for a recovery of 667 ounces of gold.

SOUTH AFRICA—As of January 1, the *Palabora Phosphate and Vermiculite Company Ltd.* entered into a manage-ment agreement with the *Trans-Rhodes Finance & Mining Company, Ltd.*, whereby Trans-Rhodes is appointed sec-retary, manager, consulting engineer, etc. of the Palabora firm. Palabora has also arranged with the government to transfer 1,810 mining claims to the *Phos-*



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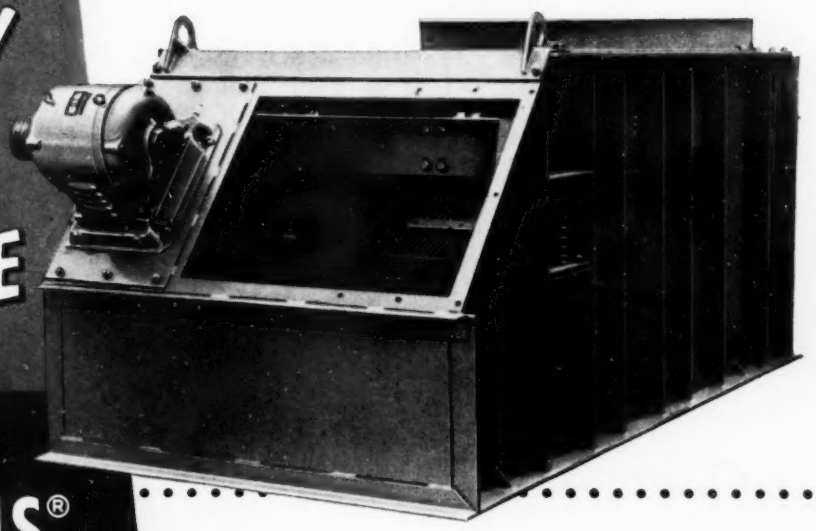
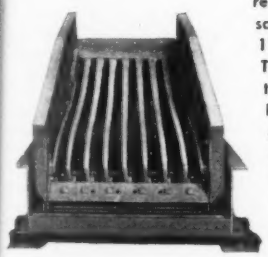


...use the SYMONS® ROD GRIZZLY

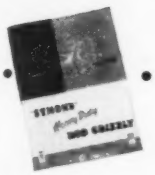
THE Symons Type K - RG vibrating Rod Grizzly is built for heavy duty service in handling large tonnages of dry, wet, sticky or gummy ores and rock. Here are some of the important features that have been incorporated into the Symons Rod Grizzly:

- *Heavy duty construction throughout . . . built to handle large tonnages under severe operating conditions.*
- *Abrasion resistant spring steel rod screening surface.*
- *Long lasting, low cost rods are easily adjusted or replaced.*
- *Effective, vigorous vibration provides thorough scalping. Amplitude of vibration can be quickly and easily changed to meet various operating conditions.*

This grizzly is ideally suited for service following most sizes of primary crushers and scalping operations requiring separations at ¾" or larger.



The *Symons Bar Grizzly* is recommended for large tonnage scalping where clear spacings of 1½" and larger are permissible. The powerful vibrating action of the Bar Grizzly makes it particularly effective for wet, sticky or gummy materials. The sloping, curved bars of the Symons Bar Grizzly tend to tumble the material as it passes over the screening surface. The tumbling action effectively assists in separating the undersize.



For full details about the SYMONS ROD GRIZZLY, send for your copy of BULLETIN 207.

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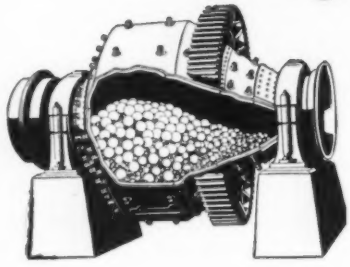
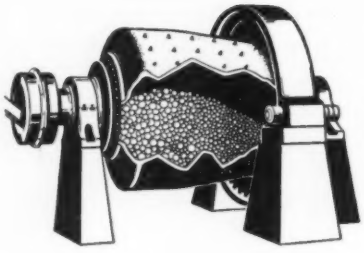
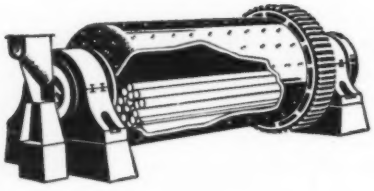
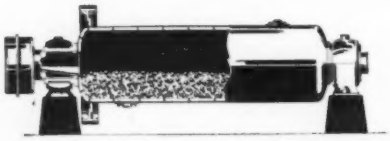
IS GRINDING YOUR PROBLEM?









HARDINGE MILLS

CONICAL MILLS

— The Hardinge Conical Ball (or Pebble) Mill is unequalled in efficiency. Grinds wet or dry, is open or closed circuit. Outstanding feature: natural size segregation of grinding media, from feed to discharge. Bulletin 17-B-3 for dry grinding; Bulletin AH-389-3 for wet grinding.

TRICONE MILLS

— Same ball segregation effect as obtained in the Conical Mill, plus additional grinding volume. Ideal for large capacity operations. Bulletin AH-414-3.

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— Ideal for producing minimum oversize in open circuit grinding. Grinds either wet or dry. Convex heads reduce friction, prevent congestion of charge at the ends, and align the rods. Bulletin 25-B-3.

TUBE MILLS

— For a fine product in open circuit without the use of classifiers. For mixing and grinding to secure a smooth texture of plastic product. Bulletin 18-B-3.

CYLINDRICAL MILLS

— The Cylindrical Ball (or Pebble) Mills have demountable trunnions, and convex heads to reduce head liner wear and increase mixing action. Supplied with or without grates, as required. Bulletin AH-389-3.

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phate Development Corporation Ltd. simultaneously, the Phospha... corporat... has granted the Palabor... compan... lease giving it the sole rig... to prospe... and mine vermiculite and ... other m... erals of the mica mineral... ical fam... at a nominal rental of £1 ... year. T... lease runs until all of the v... miculite h... been exhausted.

EGYPT—The Minstry fo... Commerc... and Industry has called for bids for th... erection of a steel plant near the Aswa... iron ore deposits in Upper Egypt. Fo... eign firms have been given four month... in which to submit their tenders. Co... tracts are also being negotiated with d... mestic firms for the development of th... deposits.

TASMANIA—When extensions to the sulphuric acid plant are completed at *The Electrolytic Zinc Company of Australasia, Ltd.*, productive capacity will be 120,000 tons yearly. The roasting section is being extended to enable the full requirements of concentrate (210,000 tons) to be roasted. Additional acid will be employed to increase superphosphate production (at present 70,000 tons) and ammonium sulphate, ammonia being scheduled for production about the end of 1954.

NEW ZEALAND—The dredge of *Arahura Gold Dredging Ltd.* which sank in March 1949 has been rehabilitated and three-shift production has been resumed. The dredge cost £A123,000 to salvage.

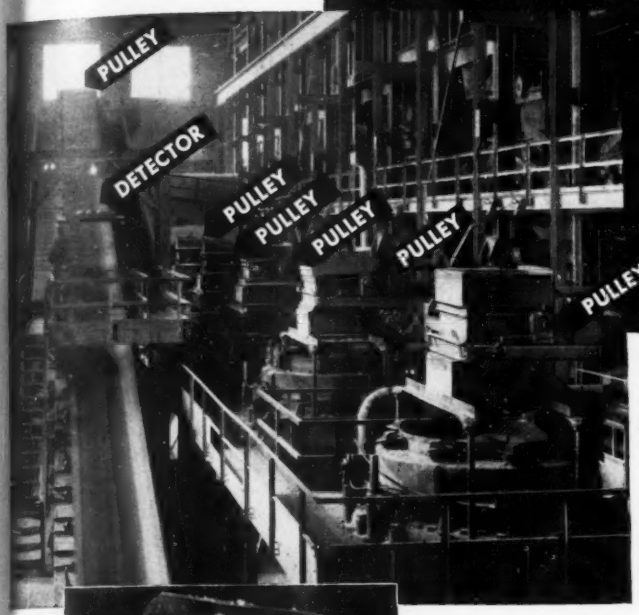
PHILIPPINE ISLANDS—Representatives of the gold mining industry are urging the government to extend tax relief to their industry. They have asked for the complete elimination of the graduated scale royalty and ad valorem tax on production. They point out that gold mining companies are paying as much as 10 percent on gold output, while other mining firms producing base metals are paying a fixed rate of 1.5 percent. Industry spokesmen also asked for exemption from the 7 percent compensating or sales tax on direct importation of mining supplies and equipment, and exemption from the 17 percent special excise tax on sales of foreign exchange.

WESTERN AUSTRALIA—*New Coolgardie Gold Mines N.L.*, one of the *Western Mining Corporation* group, continues to report favorable developments at the *Callion* mine. A recent report shows a development length of 196 feet at 33.8 dwts. per ton on lode 66 inches wide. Other mines worked by New Coolgardie are the *Hampton*, *Barbara*, and *Surprise*. Total production for 16 weeks through October 7 was 11,573 ounces gold from 19,815 tons of ore (an average of 1.68 dwts. per ton).

NEW ZEALAND—The *Austral New Zealand Mining* Ltd. dredge has been dismantled and will be shipped to Malaya after acquisition by *Austral Amalgamated Tin Ltd.*

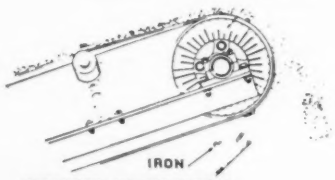
PHILIPPINE ISLANDS—*Itogon Mining Company's* gold production in December was the highest for a single month since the end of World War II. Unwatering of the 23 Sesame interior shaft has reached the point 192 feet be-

TRAMP IRON can't beat the Brains Brawn of this DINGS Iron Detector Magnetic Pulley Team



In this ore preparation plant—Quick acting Dings electronic Iron Detector checks main belt burden for large, unwieldy iron rods, rails, chunks—stops belt instantly for their removal. Then Dings Magnetic Pulleys take over the crusher protection job.

DINGS ELECTRO-PULLEY OVER CRUSHER HOPPER

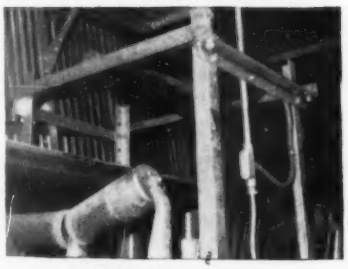


PRINCIPLE OF MAGNETIC PULLEY OPERATION

POWERFUL DINGS ELECTRO-PULLEYS . . . give fully automatic iron removal—have virtually unlimited life when given minimum attention. These units have the extra depth of magnetic field, required for heavier belt burdens—but cost very little to operate.

Installation as head pulleys in conveyor systems is usually simple—the Dings pulley shaft is machined to the dimensions of that of the pulley being replaced and the same bearings are used. Little wiring is required.

Dings air-cooled design provides cooler, more economical operation and longer life. Separate section construction plus bronze coil covers make possible the most efficient distribution, greatest penetration of magnetic field. And Dings coil winding process virtually eliminates the possibility of electrical breakdown. Get capacities and dimensions in Catalog C-1001-A.



DINGS IRON DETECTOR

Alone or in combination Dings Magnets are your best protection against tramp iron—for a look at the complete Dings line send for Catalog C-5000-B.

DINGS MAGNETIC SEPARATOR CO.
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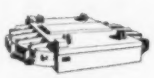

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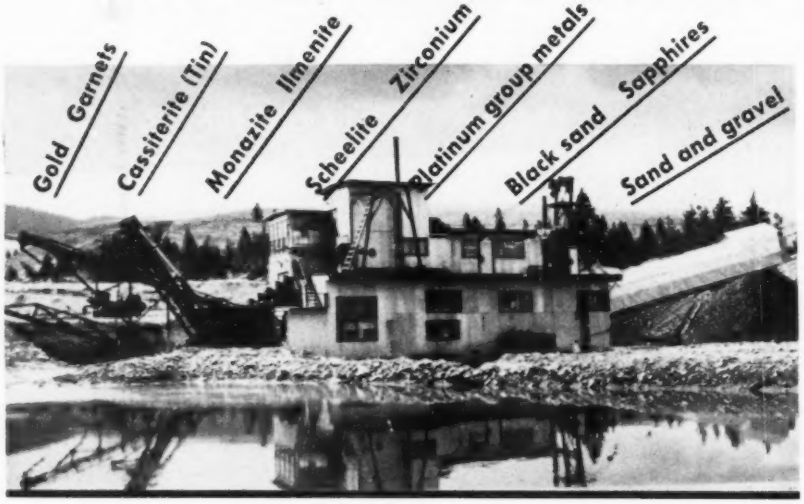

If the minerals you plan to process require the handling of huge quantities of earth, gravel or rock, consult YUBA. We have more than 40 years of experience designing and building mineral dredges used in low-cost production of big yardages in difficult formations.

YUBA mineral dredges, now operating, range in bucket capacities from 2½ to 18 cu. ft., and in digging depths from 10 feet or less to as much as 124 feet below water level. Each dredge was designed for its specific operating ground and mineral.

ASK YUBA FOR HELP

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low the 875 level, and ...velopment the new 1,000-foot ... has started. The objective of ... work is open and develop the Se... Gibson 23, and 31 veins which ... very productive on the 875 leve... Development results in the Taka and ... sections the mine were also consi...ered satisfactory in December.

TASMANIA—For the past ... months, the average ... was throughput at the plant ... King Island *Scheelite (1947) Ltd.* at Grassy, King Island, has been over 4,000 tons ... Objective for 1953 is 5,000 tons ... Installation of the new plant has ... delayed by lack of shipping facilities.

NEW SOUTH WALES—*Rye Park Scheelite, N.L.* at Boorowa reports ... the *Denver Equipment Company's* metallurgical testing laboratory at Denver, Colorado has discovered a high gallium content in a sample of ore sent there for testing. The sample was a 2 cwt. part of reject from sampling the No. 1 orebody which contains 7,500 tons of ore. (Assay of gallium was 0.14 percent.) Samples from the No. 2 orebody, 75,000 tons, have also been sent for testing. *Tungsten Consolidated N.L.* has a large interest in the Rye Park company. The *Frogmore* mine of Tungsten Consolidated is expected to yield 180 tons of ore per week during March.

PHILIPPINE ISLANDS—The gold mine of *San Mauricio Mining Company* at Jose Panganiban, Camarines Norte, is increasing production and ore of good value is being discovered. The development results on the Sta. Monica No. 1 vein were very encouraging. This work is being carried on in a section not previously explored and is opening a 4-foot vein width with quite high values. Work is being rushed to explore this vein section at a lower elevation, and if successful will have an important bearing on future operations.

NEW SOUTH WALES—Considerable interest is being taken in titaniferous beach sands along the coast of New South Wales. Although the richest beaches are in the north coast area and the south coast of Queensland), mineralized areas also extend south of Wollongong-Port Kembla. One of the principal operators (northeast coast) is *Zircon Rutile Ltd.* near Byron Bay whose plant treats about 1,400 tons monthly. Concentrate is produced in Humphrey spirals; then zircon is floated and cleaned electromagnetically. The mixed ilmenite-rutile concentrate is then treated electromagnetically to remove the ilmenite. The rutile is cleaned by electromagnet and electrostatic processes. The final concentrates are 99.5 percent zircon, and 97.5 percent rutile. Australia is the world's leading producer of rutile.

QUEENSLAND—*Ravenshoe Tin Dredging Ltd.*, formed to work leases near Mount Garnet, will acquire the dredge of *Barrytown Gold Dredging Ltd.* The price is £A85,000. The Barrytown (New Zealand) dredge is dismantled and awaiting shipment.

NORTHERN TERRITORY—High-grade ore has been reported from *Home of Bullion Mines Pty. Ltd.* at Barrow Creek. Copper running as high as 69 percent is being mentioned. The company has built an experimental reverberatory furnace (the first in the territory) and plans to build a larger one early next year. Consulting geologist Terence Connelly has inspected the property for United States interests.

Traylor

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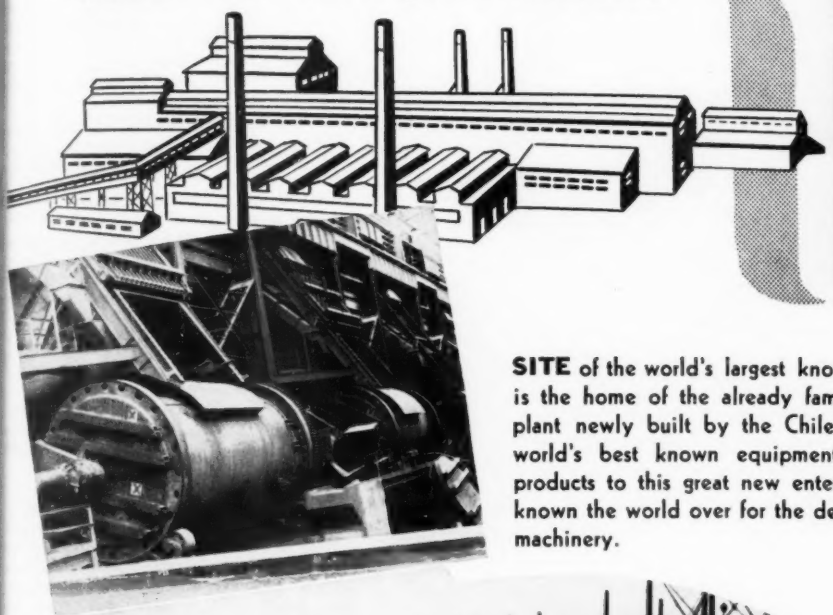
FOUR 13'-0" x 30'-0" Pierce-Smith Converters

ONE 41'-3' Anode Casting Wheel

ONE 10" x 16" Type H Jaw Crusher

ONE 7'-6" x 315'-0" Rotary Kiln

ONE 60" Gyratory Crusher



SITE of the world's largest known copper ore body, "Chuqui" is the home of the already famous 111 million dollar sulphide plant newly built by the Chile Exploration Co. Many of the world's best known equipment manufacturers have sent their products to this great new enterprise. Among them is Traylor, known the world over for the dependable operation of its mining machinery.

For many years, Traylor has supplied the world's leading copper and nickel producers with converters of the Pierce-Smith type in sizes up to 13' x 35'.

Photo shows the new plant going up around a 7'-6" x 315' Traylor Rotary Kiln. This Kiln was specially designed for the job.

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For 50 years, Traylor engineers have worked with the mining industry, studying its needs and developing advanced equipment to meet its demands. That is why, wherever extreme efficiency is required, Traylor machinery is specified. It takes experience to keep machine designs ahead of production demands. Traylor has experience . . . half a century of it.

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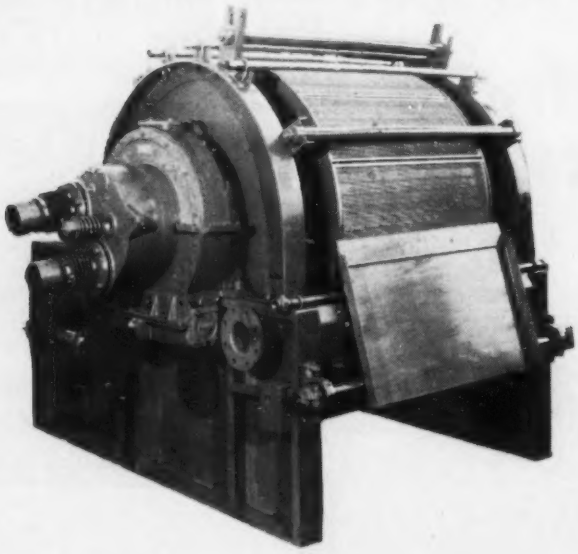

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The machine pictured above is but typical — all acid proof materials, panel deck, press roll blanket with wash apparatus, large automatic valve with high capacity for multiple wash separation and large volumes of filtrate.

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VICTORIA—Output of gold contin to increase from the dred of Harr *ville (Tronoh) Ltd.* at H ietville, largest dredge in the So thern He sphere. The production ra should ceed 1,000 ounces per m th when old tailings have been rev cked. Ap from the Harrietville, othe dredges erating in Victoria are *Free ough Dr ing, N.L., Central Victo Dredg Company N.L.* operating dredges Amphitheatre and Jim Cro Creek, *Cocks Eldorado Gold Dred ng N.L.* Eldorado. Gold is the on important metal currently being mined in the st A rise in price is reportedly ha needed, although 1952 saw some crease in output (around 71,000 ounc

NORTHERN TERRITORY—*Terr Enterprises Pty. N.L.*, a subsidiary of *Zinc Corporation Ltd.* officially took the Rum Jungle uranium field as agen for the Commonwealth Government January 2.

WESTERN AUSTRALIA—*Blue Spe Mining Company N.L.* reports interes ing developments: tungsten appears a all levels, assaying 10.5 percent WO over 48 inches and 4.5 percent over 4 inches. More recently, a report gives 2 dwts. gold and 10.88 percent antimo over 48 inches below part of No. 4 lev The company is to issue 130,000 ne five-shilling shares at par, proceeds to b applied to additions and alterations to the plant and development of leases.

EUROPE

ITALY—The new electrolytic zinc plant built by *A.M.M.I.* at Nossa (Bergamo) has recently started operating. The plant will process ores from the nearby mines of the *Societa per Azioni Piombo e Zinco (SAPEZ)* and A.M.M.I. at Riso in north central Italy and other sites. It is currently producing below capacity because of the unfavorable market conditions. Some trouble was experienced in the beginning because of small amounts of fluorine in the concentrate that caused sticking of the zinc deposit on the cathode starting sheets. The plant was built with financial help from the Economic Cooperation Administration and the loan will be repaid in kind.

NORWAY—The new sulphur pyrite mine at Skorovas in northern Norway, now in operation, will produce 150,000 tons of pyrite annually; present Norwegian output is about 700,000 tons a year compared with 1,000,000 tons before the war. The *Skoravas* deposits are estimated at around 7,500,000 tons, with a sulphur content of as high as 51 percent and a copper content of 1.5 percent. The Skoravas mine is the first mine in Norway to use the Heavy Media Separation process for beneficiating the ore. A 28-mile aerial tramway, the longest in Norway, carries the concentrate from the mine to the shipping terminal, nearly all of which is exported.

AUSTRIA—An unexpected production boost during the third quarter of 1952 has resulted in an all-time peak aluminum production of 36,000 metric tons, 11,000 tons more than in 1951 and eight times as much as the pre-war production level. The *Ranshofen Works*, the largest

plant of the Austrian aluminum industry, produced 31,000 metric tons, while the *Lend* factory produced the rest. Ranshofen plans to reach the 40,000-metric-ton mark in 1953.

PORTUGAL—The tungsten firm, *Attantica*, is reportedly planning to sue the United States government for $3,250,000 for voiding a $9,000,000 contract to buy tungsten concentrates. The contract was cancelled on October 30 because a federal employe was to receive a 5 percent commission for arranging the negotiations.

YUGOSLAVIA—During the first three quarters of 1952, Yugoslavia shipped 260 metric tons of mercury to the United States, out of a total export quota of 400 metric tons. The remaining portion of the exported material went to Western Germany, Austria, The Netherlands, Belgium, and Switzerland. The annual domestic consumption of mercury is only about 20 tons.

NORWAY—The *Undal* mine in central Norway is now in production. The crushing plant was completed in November, and about 3,000 tons of pyrite were crushed within the first month. Production this year will be about 5,000 tons per month with 40 percent sulphur and 1.1 percent copper. The output next year is planned for only 9,000 tons per month while development work continues in the mine. Thereafter, production is expected to be raised to 20,000 to 30,000 tons monthly. Pumping out of the old mine was started in 1951 and the crushing plant started up one year later. Mining engineer Nils Bjornvik has been in charge.

RUMANIA—The Rumanian Minister of the Metallurgical Industry, Carol Loncear, reports that 1952 production amounted to 260.3 percent of the pre-war production level (1938). The industry processed more than twice as much steel in 1952 than in that pre-war year.

ITALY—Work on the pumping station at the minus-100-meter level of the *Monteponi* lead-zinc mine in southwestern Sardinia is progressing satisfactorily. This station is of particular importance because it will drain not only that mine but a number of other mines in the area. A pumping station on the minus-40-level and a drainage tunnel at the plus-15-level are already doing this. The drainage tunnel discharges to the Mediterranean Sea. Construction and operating expenses are shared among the companies whose mines are affected by the drainage project.

AUSTRIA—Mining operations started during January in the Wipp Valley of the Tyrol to obtain the first kyanite ($Al_2O_3 \cdot SiO_2$) in Europe. These newly discovered deposits are estimated to contain several million metric tons, sufficient to fill Europe's needs which are about 45,000 metric tons per annum. Mined by the *Wipptal Baugesellschaft (Wipp Valley Engineering Society)*, early tests gave encouraging results.

YUGOSLAVIA—Work is expected to start soon on construction of a manganese separator at the *Zletovo* mine in Macedonia. Completion is scheduled for 1954, with a production capacity of 24,000 tons of concentrate per year.

GREECE—*Mediterranean Mines Inc.* operated its treatment plant at a rate between 150 and 250 tons per day during 1952. A lead and a zinc concentrate were produced, in addition to a small quantity of pyrite. Operations were carried on under considerable difficulties because of the erratic character of the ore and the presence of oxidized material. A new area is presently being opened and explored by the extensions of old workings.

LUXEMBOURG—Iron ore production in October hit a post-war high of 670,502 metric tons. September output was 659,800 tons. Exports during October included 223,746 tons to Belgium and 41,636 tons to Western Germany. In the first ten months of 1952, total output was 6,038,609 tons, compared with 4,544,317 tons in the same period of 1951.

SPAIN—During 1952, Spain exported 1,360,000 tons of iron ore from Bilbao. Most of this is said to have been exported to Germany.

ITALY—A serious fire in the *Perticara* (Marche) sulphur mine, one of the foremost in continental Italy, has been brought under control and work is now proceeding. One section had been closed down during the fire but work has been resumed here, too.

NORWAY—Current production from the Heroya magnesium plant in southern Norway is about 4,000 metric tons a year. Operations were started late in 1951 when it was planned to produce about 5,000 tons annually, and it is still hoped that this goal will attain. Bulk of the output goes to the United States. *Heroya Elektrokiemiske Fabrikker* is a subsidiary of *Norsk Hydro-Elektrisk*.

YUGOSLAVIA—In the Kossovo-Metochia area near the Yugoslav-Albanian border, the Yugoslav government has reported the discovery of zinc and lead deposits. Mining operations are scheduled to start early this year.

NORWAY—Discovery of new deposits of pyrite, containing zinc, lead, and copper, may result in increased production at the *Bleikvassli* mines in northern Norway from 10,000 to 50,000 tons per year.

FRANCE—The *Salsigne Gold Mines and Refineries Company*, in accordance with the repercussions of the low price of gold, foresees a steady reduction in its activities and even the total closing down of its operations at Salsigne, Villaniere and Lastour unless public authorities provide a prompt and effective solution, in the form, for example, of fiscal and social deductions.

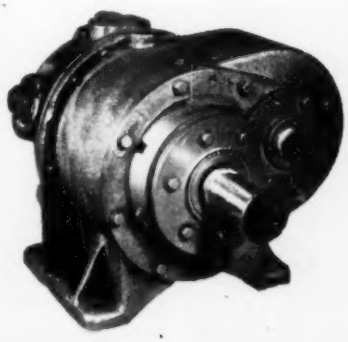
NORTH AMERICA

NORTHWEST TERRITORIES—*Goldcrest Mines, Ltd.* has concluded a deal for a group of claims covering a high-grade silver-nickel-cobalt find in the Great Slave Lake area on an island known locally as Easter Island, about 70 miles southeast of Yellowknife. Native silver, cobalt, minerals, and niccolite (Ni As) are stated to occur in a strong break which has been traced for several hundred feet. Selected samples, assaying up to 2,000 ounces silver, 0.83 percent cobalt per ton, have been obtained in three pits over a length of 200 feet along the main break. This break was again picked up about 3,000 feet further along the strike and shows niccolite and other mineralization but no sampling has been done here as yet. Further surface work consisting of a series of trenches along the main break plus systematic diamond drilling, is planned.

QUEBEC—*Cassiar Asbestos Corporation, Ltd.* has decided to boost previous

Eimco

Dependable Geared Air Motors



Eimco Geared Air Motors are husky, powerful units built to work on a continuous operating basis with a minimum of attention.

All gearing, shafts and bearings are designed to work under continuous peak loads.

Power units are Eimco 5 cylinder, radial-type, reversible air motors. These motors have a high starting torque and work efficiently on pressures from 40 to 125 p. s. i.

Eimco Geared Units are available in three sizes, conservatively rated at between 7½ to 17 h.p., each with four different speed ratios.

Eimco Geared Air Motors are the only completely safe, completely dependable units.
Write for Bulletin AE6001.

EIMCO 1459

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McCarthy Drills FOR EASIER—FASTER BLAST HOLE DRILLING

- McCARTHY DRILLS PAY THEIR WAY
- MAKE MORE MONEY FOR YOU
- RECORDS SHOW 40% MORE HOLES
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FOR VERTICAL *OR HORIZONTAL* BLAST HOLE DRILLING

At an open-cut mine in Muswellbrook, Australia, Theiss Bros. Proprietary Ltd., was confronted with a difficult blast hole drilling problem. Shot holes for overburden removal had to go through hard slate and conglomerate. In spite of these unusual conditions Theiss Bros. averaged 300 feet of 6- to 8-inch holes per day using a truck-mounted McCarthy Vertical Blast Hole Drill. They say there's nothing better. Holes averaged 16 feet deep, but in some cases reached 46 feet. For further information on this rugged, dependable drill write Salem Tool Company and a representative will call on you.

At the famous Jurassic iron ore system in England heavy limestone has been encountered under sand and boulder clay before reaching the ironstone. The 20-ft. slab of limestone is broken up for the dragline by the dependable McCarthy Horizontal Blast Hole Drill. Highwall is protected and left virtually intact by buffer blasting. Blast holes are drilled 80 feet deep with explosive charges being placed in the back 50 feet. Space behind the open cast gelignite is stemmed with sand. The McCarthy Blast Hole Drill is specially mounted on a shovel for faster positioning up along the wall. Three tons of explosives are usually detonated in one blast. McCarthy Auger Drills are in use all over the world for many purposes. Write Salem Tool Company direct and our representative will call on you.

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Find out more about time-saving, money-saving Sauerman Scrapers. Write today for free, illustrated catalog on bulk handling methods.

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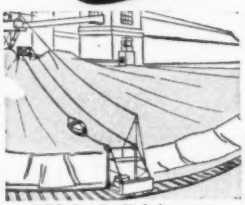
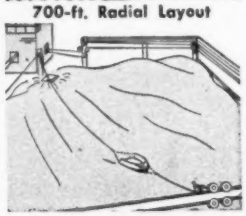
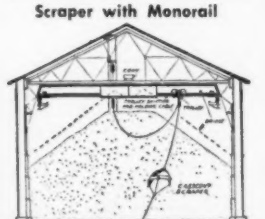


700-ft. Radial Layout



Scraper with Monorail



Scraper in Storage Shed

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- High efficiency
- Dependable performance
- Trueline stroke
- Large capacity

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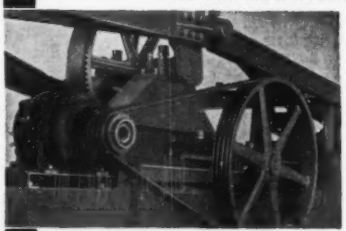
DEPENDABLE CLASSIFIERS THAT IMPROVE PERFORMANCE, SIMPLIFY OPERATION AND LOWER MAINTENANCE.



Large and quiescent pool areas give high overflow efficiency. Long "Trueline" strokes, parallel to the tank bottom, discharge the maximum quantity of sands. Fabricated steel construction gives extra strength and long service.

COMPACT DRIVE
SMOOTH OPERATION
METALLURGICALLY RIGHT

WRITE FOR BULLETIN

MB

MORSE BROS. MACHINERY COMPANY
ESTABLISHED 1898
DENVER, COLORADO, U. S. A. (CABLE MORSE)

drilling plans substantially, as well as to arrange for major new financing, in view of the excellent quality shown by the asbestos fibre and the "most satisfactory" results secured in an adit at the 250-foot horizon. Plans now call for placing the property in production at a rate of 500 tons daily with this objective to be reached by the summer of 1954. Initial production at 150 tons daily, is expected by July 1, 1953. Funds required to cover the new program are placed at $4,500,000. To assist in raising this sum, arrangements have been completed for *Turner-Newall, Ltd.* and *Raybestos Manhattan, Inc.* to participate in further financing. President of Cassiar Asbestos Corporation is F. M. Connell.

MANITOBA—*Cyprus Exploration Corporation* is sinking its first drill hole on a uranium prospect in northern Manitoba. Initial plans call for drilling 10 holes, five cutting the zone at 75 feet and five at 150 feet. Trenching had shown the zone to be 850 feet long with both ends open.

SASKATCHEWAN—The *Hudson Bay Mining & Smelting Company* plans to sink two shafts on its copper-gold property in the Birch Lake district of Northern Saskatchewan. One shaft location is to be a few hundred feet from the eastern shore while the other is to be at the southern end of the lake. There appear to be two separate mineralized zones. Both shafts are to be fully developed, according to the present company program. Preparations have already been made for shaft sinking at the eastern Birch Lake site, on completion of which the shaft sinking crew will move to the southern location. Electricity for both shafts will be supplied by extensions of the power line already existent at the *Asfe* mine, some seven miles northeast.

ONTARIO—Uranium assays secured on the property of *Faraday Uranium Mines* of Hastings County, Ontario may prove important. The uranium is in a diabase dike enclosed by micaceous schist. No. 5 hole showed 92.3 feet of radioactive material averaging 0.097 percent U_3O_8. The No. 4 hole, 50 feet distant, also showed 90 feet of slightly lower grade mineralization. Diamond drilling is being resumed on the company's *Axe* group in the Goldfields area. Added drilling will be done to see if the strike is possibly north-south.

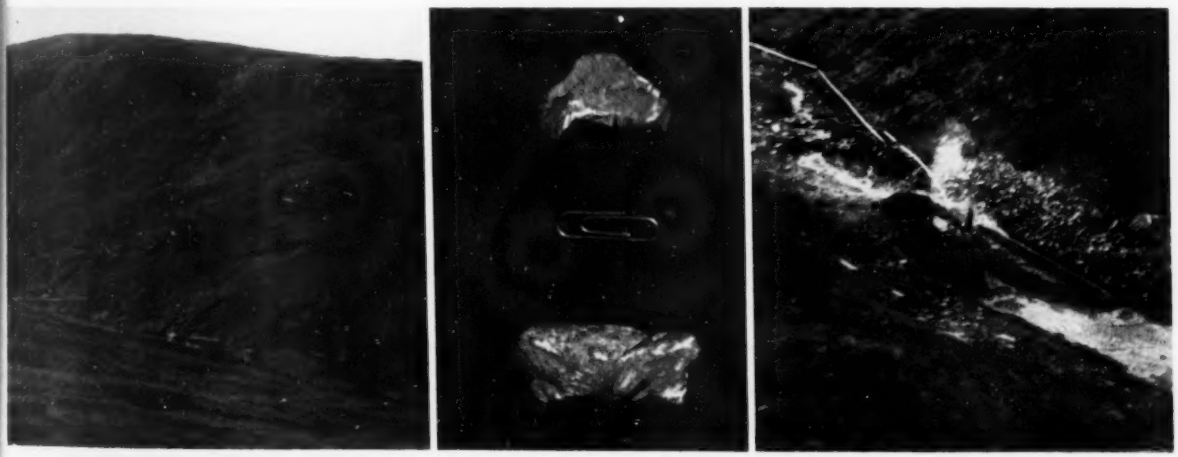
MICHIGAN—The *Ford Motor Company's* two iron ore ships carried 908,379 gross tons of iron ore and limestone to the Rouge plant at Dearborn during the 1952 shipping season on the Great Lakes. Other ships under contract to Ford carried an additional 608,397 gross tons of iron ore and 468,409 gross tons of limestone. A third 3,000-hp. ship will be added to the Ford fleet this season.

SASKATCHEWAN—*Sherritt Gordon Mines Ltd.* has announced plans for treatment of copper concentrates at its Fort Saskatchewan refinery as soon as additional treatment capacity can be provided. The refinery was designed primarily for nickel recovery. *Noranda Mines, Ltd.* took over treatment of copper concentrates from Sherritt Gordon's *Lynn Lake* mine when the *Hudson Bay Mining and Smelting Company's* smelter was unable to do so as originally planned. A substantial overall increase in copper production costs resulting from higher smelting costs and freight charges has spurred the plans for treatment of concentrates at Fort Saskatchewan where foundations for main buildings of the nickel refinery have been completed with erection of structural steel scheduled to start immediately. Erection of permanent mining plants has been completed at both "A" and *El* mines at Lynn Lake. Shaft sinking and station cutting at the El mine is making good progress. The permanent headframe is to be erected in the second quarter of 1953 at the "A" mine. Underground work at the "A" has been concentrated on preparation of the orebody for production. Beneficial results have been obtained from changes made in the flotation circuit of the 50-ton pilot mill started up last September.

NORTHWEST TERRITORIES—*Salmita Consolidated Mines Ltd.* has constructed a tractor road from its *Matthews Lake* gold-tungsten property into Yellowknife Town, approximately 175 miles southwest. Route of the road was selected by aerial survey. The company plans to establish regular deliveries of supplies and equipment by "cat" train controlled by two-way radio communication, a feature believed to be unique for this method of transportation.

ALASKA—*Decoursey Mountain Mining Company* has been formed recently to operate leases it has acquired in the lower Kuskokwim area at Sleepmute, Crooked Creek, and Decoursey Mountain. Tests in the Sleepmute area, the only location presently in operation, reportedly show ore running as high as 650 pounds of mercury to one ton of ore, and plans are developing to put the other two locations into operation as soon as a qualified mining superintendent can be located.

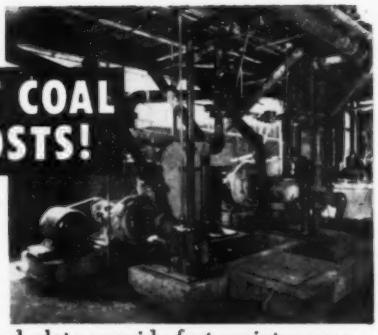
QUEBEC—Diamond drilling is under way on the copper-zinc property of *Maxim Mining Corporation, Limited* in Trecesson Township, northwestern Quebec, to test shear zones and anomalies indicated by a geophysical survey. I. C. Christopher, geologist, is in charge of drilling.



DEVELOPMENT WORK CONTINUES AT ALASKAN BISMUTH MINE

During 1952, Native Bismuth, Inc. continued development of its Charlie Creek bismuth mine, 35 miles north of Nome, Alaska, under the direction of president O. A. Margraf. A good truck trail was built 13 miles at a cost of $8,500 to reach the mine. The territorial government advanced $5,000 to aid in this road construction. In the picture above left, the mine camp may be seen in the bottom foreground; the mine adits portalling near creek bottom left; and the series of crosscutting bulldozer trenches excavated during 1952. The uppermost trench extended the known length of the mineralized vein —about 150 feet westward. In the center photograph, several bismuthenite (Bi_2S_3) placer nuggets are shown, with a paper clip for size comparison. The photograph at the right shows the sluicing operation from which the nuggets were recovered. The bulldozer pushes creek gravel into the sluice box. A small giant set on the bank washes the gravel through the box. In addition to the bismuth, placer gold is also recovered in the sluicing. The placering was done to test-sample the creek bed below the mine workings. An important new use of bismuth is in the bismuth-manganese-iron magnet. As the United States Atomic Energy Commission's nuclear power program develops, liquid bismuth may find an important use as a coolant.

NAGLE PUMPS CUT COAL PREPARATION COSTS!



Three Nagle 6" type "T" pumps are shown handling slurry to waste from coal washing operations at a modern preparation plant.

Split bearing stand and quick-off end plate provide fast maintenance or dismantling. Easy-to-reach stuffing box. Simple, fast slippage seal adjustment. Wear resistant water end parts—features that cut cost and eliminate shut-downs. Reasons why more and more coal companies are turning to Nagles. Get the facts!

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Facilitates priming of pumps stationed above water level. Basically a water operated jet, it fills pump intake pipe with the liquid necessary to start operation. Easy to install—efficient.

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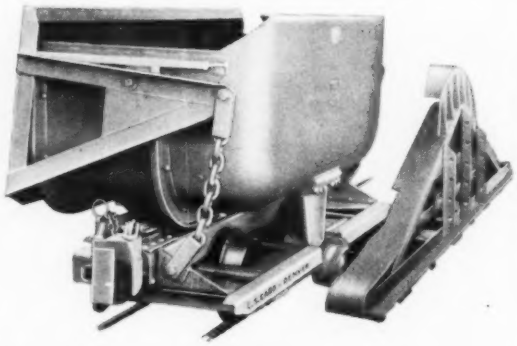
Lower Mine Haulage Costs

are in the **CARDS**



Card cars are available engineered to your individual requirements. Before you settle on misfit equipment because it's "standard," let us quote on your *exact* needs. On the basis of cost per ton-mile haul, *Card* equipment saves you money.

Our 60th year of service to the mining industry

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NEVADA—Nevada iron ore mines shipped more than 2,000,000 tons of high-grade iron ore to Japan during 1952. The largest amount came from the *Imperial Iron Mines*, located near Pioche, Nevada, which shipped over 1,000,000 tons. Other shippers included *Mineral Materials Company*, *Dodge Construction Company*, *Nevada Iron Ore Company*, and *American Ore Company*. Production in 1953 is expected to be even higher. *George Green Mining Company* is one of those who will begin new operations in Nevada, with an initial goal of 500 tons of iron ore daily destined for Japan.

ONTARIO—*Steep Rock Iron Mines, Ltd.* expects to start producing from its underground operations at the "B" or *Errington* mine early this year, with stoping underway by July. The open pit section of the Errington is expected to be discontinued after this year. Stripping of overburden is making satisfactory progress at the "*A*" or *Hogarth*. It is expected that between 250,000 and 500,000 tons will be mined from the area in 1953. In anticipation of increased production by 1954 and 1955, centralized traffic control is being installed on the rail line which will eventually permit rail shipment of 5,000,000 tons of ore to docks at Port Arthur annually.

UTAH—*Silver King Coalition Mines Company* and *Park-Utah Consolidated Mines Company* are planning to merge. Directors of both firms have approved the consolidation which would mean the formation of a new company. Properties of both groups are located in the Park City district of Utah and are adjacent. Both produce lead, zinc, copper, gold, and silver, and both have been closed for a number of months because of the low prices for lead and zinc. In merging the two firms believe that they would have greater efficiency in exploration, production, drainage, and similar operational matters.

YUKON TERRITORY—Heavy equipment is being installed in the new concentrator building of *Mackeno Mines Limited* and production is expected to start soon. Ore reserves on December 1, 1952 were estimated at 62,640 tons, averaging 40.8 ounces silver, 10.9 percent lead, and 6.0 percent zinc per ton. Continuing to the southwest on the third level, development work is being carried out on the McLeod and Sime veins.

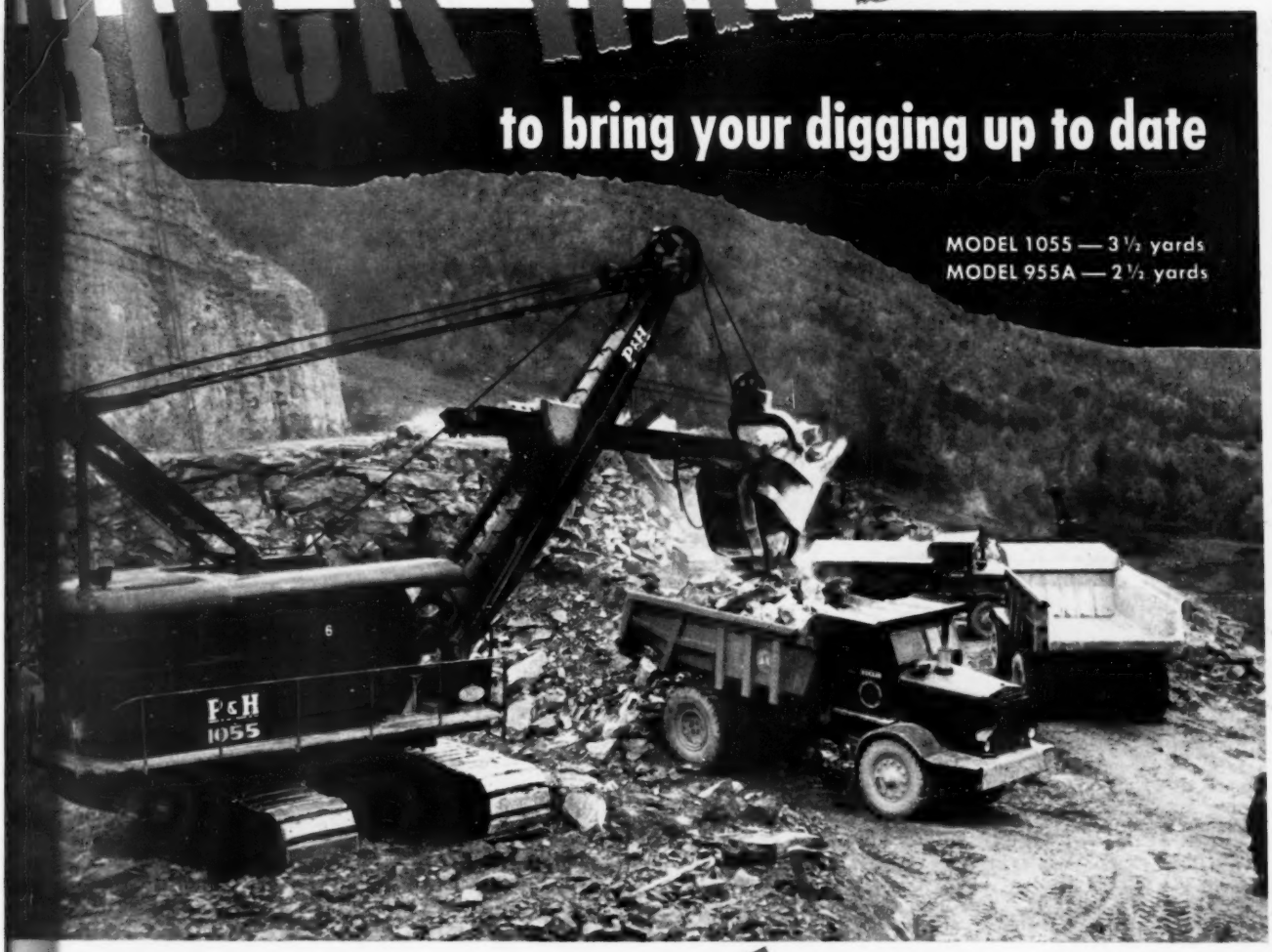
NEW MEXICO—The *Pumice Corporation of America* has been sold to the U. S. *Gypsum Corporation* who has large holdings of perlite in the area. Pumice has an open pit mine and treatment plant near Grants, New Mexico.

MANITOBA—Two northern prospectors have reportedly made a discovery of uranium at Dion Lake in Northern Manitoba, about 120 miles east of Flin Flon. How big the occurrence is has still to be determined by assays of the Dominion and Provincial mines departments. Assays of the samples tested are said to show high content of uranium oxide. This Dion Lake discovery is actually said to represent a uraninite occurrence. The uraninite is claimed to be disseminated over an average of 20 feet in width for 800 feet of completed trenching, but in some places is said to extend to a width of 50 feet.

ONTARIO—Mine Manager James H. Price of *Penn-Cobalt Silver Mines Ltd.* reports that good grade cobalt ore, running $120 to $160 to the ton at the $2.00-per-pound price for cobalt, is being opened up by Penn-Cobalt at the

ROCK RATED

to bring your digging up to date



You have the jump on costs when your new P&H takes over the tough digging jobs. Why? Because there's no other machine to match its performance. You have the speed — a 15% to 25% faster digging cycle — for bigger production. You have the all-welded strength to take shock loads that would K.O. less rugged machines. You have the stability to exert more power at the tooth point. That gives you added capacity.

If you're ready to cut your costs, these P&H's are ready to help you.

P&H MAGNETORQUE*
ELECTRIC SWING

the greatest shovel improvement in 20 years. It's smoother, faster, more dependable. It eliminates the old swing frictions with their constant headaches and replacement costs. Magnetorque lasts the life of your machine. You should know the facts about it!

**T.M. of Harnischfeger Corporation for electro-magnetic type coupling.*

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WE say the Allis-Chalmers HD-20 is

Designed to Outproduce

Built to Outlast

but anyone can make claims

. . . . . That's why we invite you to get the facts firsthand from HD-20 owners. Just call your nearby Allis-Chalmers dealer. He'll be glad to tell you where you can see these great tractors at work . . . where you can talk to those who own and operate them. When you do, experience tells us you'll hear about these big benefits:

Hydraulic torque converter drive gives the operator the equivalent of hundreds of gear ratios in two speed ranges — automatically selects the proper speed for maximum production. With hydraulic torque converter drive, you take full advantage of available horsepower . . . even at creeping speed. And cushioned protection means fewer repairs . . . longer life of tractor and auxiliary equipment.

In any pushing or pulling work, there's nothing like the HD-20 for sheer productive power. Torque converter actually multiplies torque up to four and one-half times . . . develops tremendous drawbar pull to start the load smoothly, and automatically accelerates to highest speed conditions permit, in either high or low range.

New design. The HD-20 is built to take it — with such design advantages as all-steel welded construction . . . balanced weight and power . . . extra heavy main frame. Hydraulic control permits steering this 20-ton giant with only the touch of a finger.

Easy to service, easy to maintain. 1,000-hour lubrication intervals for truck wheels, idlers, support rollers; no lubrication fittings under tractor. Major units are easily removed without disturbing adjacent parts; adjustments are simple.

See for yourself the many profit-making applications of the HD-20. Ask your Allis-Chalmers dealer to show you this outstanding tractor at work.

41,000 POUNDS

175 NET ENGINE HORSEPOWER

GM 2-CYCLE DIESEL ENGINE

ALLIS-CHALMERS

TRACTOR DIVISION • MILWAUKEE 1, U. S. A.

175-foot level of its *Kerr Lake* mine. Three distinct cobalt veins have been established at the Kerr Lake and *Crown Reserve* mines.

BRITISH COLUMBIA—*Estella Mines, Ltd.* reports that assays from the No. 1 winze being sunk as a preliminary to a depth development program, showed 9.0 percent lead and 28.9 percent zinc across 2.5 feet on the hanging wall side. The company's property is located in the Cranbrook district near Wasa.

QUEBEC—*Ascot Metals Corporation Ltd.* reports that copper-zinc-lead-gold-silver production had been continuing at 650 tons daily with 450 tons coming from *Suffield* mine and 200 tons from *Moulton Hill* mine. Present plans, however, are to take all production from the Suffield mine because at present metal prices the Suffield operations can be maintained at a lower cost and with higher grade than at Moulton Hill.

NORTHWEST TERRITORIES—*Rankin Inlet Nickel Mines Limited* has completed the season's work, with 10,548 feet drilled in 1952. General Manager John Drybrough comments that the problems of drilling permanently frozen ground appear to be solved. Additional cross-sectional drilling has brought a new estimate of the orebody pointing out that the mineralized zone consists of three sections: a high-grade lens at the footwall extending from the surface as much as 220 feet down the dip; below the high-grade lens, the mineralization continues narrower and lower in grade as much as 300 feet to the fault; and about 20 to 40 feet from the hanging wall of the high-grade lens is a lower grade lens. Estimates of tonnage are: high grade, 245,000 tons of 1.15 percent copper and 5.03 percent nickel; medium grade, 90,000 tons of 0.73 percent copper and 1.97 percent nickel; and low grade, 100,000 tons of 0.51 percent copper and 1.25 percent nickel.

SASKATCHEWAN—*Strike Uranium Mines Ltd.* reports that geological mapping, surveying, and sampling are being conducted on its Beaverlodge Lake property. A total of 70 chip-hammer samples, taken from zones No. 1-A, 1-B, 2, 3, 7, 8, and the GUS zone, have been sent to *Uranium Assays Ltd.* for assay. Surveying and establishing claim lines operations are being completed. A camp has been established on *Eldorado Mining & Refining (1944) Limited* ground, adjacent to the Strike Uranium piece, by permission. Work is under the direction of Norman C. Byrne, consultant, and John H. Parker, resident engineer.

ASIA

INDIA—The government of Madhya Pradesh state is encouraging the federal government to locate the proposed steel plant in the eastern part of the state near the coalfields (Bilaspur district). Two sites, Orissa and Madhya Pradesh, have been tentatively selected and the final decision is expected shortly. The 900,000 rupees plant will have an estimated capacity of 35,000 tons of steel and an equal amount of pig iron annually. The presence of large deposits of coal is one of the main considerations in favor of Madhya Pradesh. A preliminary survey has already been made for construction of a 23-mile Champa-Korba railway which will cost about 900,000 rupees. The state government had once considered developing the area as a state enterprise but has now released it for private prospecting.

JAPAN—The Japanese government is expected to return the buying and selling of wolframite to private business, and is currently using up stocks accumulated during the war instead of purchasing new supplies. This new demand for wolframite is not expected to increase the world price, however, which has actually dropped recently. As of December 30, the official price for wolframite in Great Britain was reduced by 40 shillings to 370 shillings per long ton unit C.I.F. and the buying price for scheelite was cut to 360 shillings C.I.F.

CHINA—Chinese reports declare that more than 88 factories and mines in the northwestern part of the country were ahead of schedule in fulfilment of the 1952 production plan. Included are the Anshan steel plant and the Mukden steel plant. Mukden completed its plan four weeks ahead of schedule because of an increase in labor productivity coming from improved working processes. For example, high-speed smelting of copper reportedly cut average smelting time per heat by about 40 percent. The Anshan plant reached its production goal on December 10. Steel output from this plant increased 35 percent over last year's, or 33 percent above the highest level under the Japanese occupation.

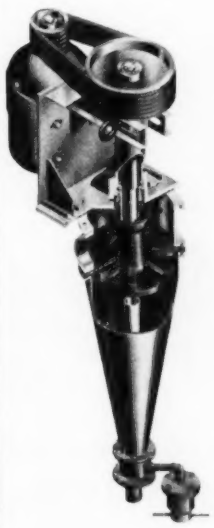
PAKISTAN—Large iron ore deposits were found in the Mianwali area of Punjab state by German experts working in cooperation with the Office of Industrial Development. The deposits are believed adequate to meet the country's regular needs. A company is expected to be formed soon to develop the area, with half of the capital coming from private sources and the remainder being supplied by the Pakistan government.

INDIA—K. D. Malaviya, Deputy Minister of Education and Natural Resources, is quoted as saying that the government is considering a proposal to ban the export of scrap mica for a period of two years as an experimental measure. He said that an attempt is being made by foreign countries to produce synthetic mica from the Indian scrap mica. A ban on the export might prevent production of synthetic mica since India's export of scrap mica constitutes 80 percent of the world's supply.

BURMA—The Burmese Army has opened a campaign to regain the British-owned *Maucchi* wolframite mines lost to the Karen tribesmen in guerrilla warfare three years ago. These mines supplied about 10 percent of the world's needs before World War II, and it is believed that the strategic ore is financing the uprising of the Karen group by being smuggled

For unusual sizings

Have you considered the **CENTRICLONE** *Classifier?*



Here is the tipoff that this is a new and better solution to numerous classification problems: ***Of the first hundred Centriclones sold, more than 50% were reorders.***

The Centriclone Classifier provides sharp, fine separations with greatest economy by combining some characteristics from both the wet cyclone and the centrifuge.

These are the Centriclone Classifier's outstanding fields of application:

- ***Closed circuit fine grinding***—Centriclone classifies without slurry dilution (Example: –50 mesh overflow product at 65% solids).
- ***Sharp classifications at 200 mesh***—A sharp split between +200 and –200 mesh can be made at 30 to 40% solids.
- ***Sub-sieve sizings***—In more dilute slurries the Centriclone can classify at 325 mesh or even as fine as 10 microns in some cases.

WRITE TODAY—Our mineral dressing engineers and pilot plant facilities are available to service your specific problems.

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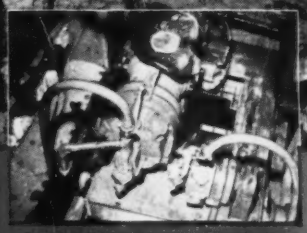
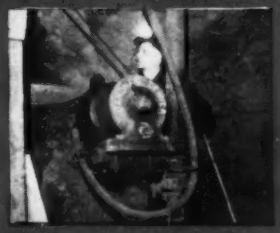
SPEED and POWER under FINGER-TIP CONTROL with GARDNER-DENVER AIRSLUSHERS

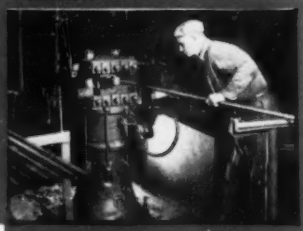


Speed shaft sinking with the Double Drum HMS Shaft Mucker.

other GARDNER-DENVER ways to reduce mining costs:



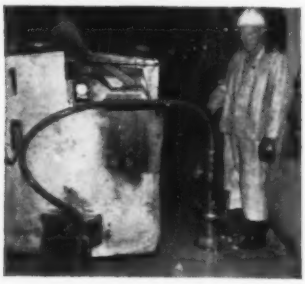
Put tugging power where you want it, with compact Air Hoists.



Sharpen drill steel on the fast-acting D66 Sharpener.

Protect rock drills with the L012 Automatic Line Oiler.

Handle water with the pneumatic pump that keeps grit out of the seal and bearing —the VP4.



Write for Bulletins describing Gardner-Denver Mining Equipment.

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THE QUALITY LEADER IN COMPRESSORS, PUMPS AND ROCK DRILLS

to Thailand and sold on the "free market." The Burmese government needs output of the mines to put itself back on its feet economically.

CHINA—The foundation for a large steel plant at Auchan in northeast China reportedly has been completed. Soviet aid is said to have played an important part in its construction. A number of new factories are being built to form an industrial combine. Many of the plans have been drafted by Soviet engineers and considerably quantities of equipment have been brought from the Soviet Union.

PONDICHERRY, FRENCH INDIA—Gold merchants in French India are seeking permission from the government to re-export gold to France where the price for gold is substantially higher than in Pondicherry because of the recent French political crisis. The Commissioner for French India gave the Bank of Indochina in Pondicherry permission to re-export 1,107,083 ounces of the gold imported earlier, before prohibiting the export of fine gold completely. Later, the Bank received special permission to export another 110,000 ounces. The Minister for Economic Affairs says that the government will not allot any foreign exchange for the import of gold.

AFGHANISTAN—A survey of large-scale economic development of northwest Afghanistan undertaken by the United Nations has reportedly been completed, and discussions are in progress in New York about the terms of development contracts. The survey covered all local economic resources. A spokesman for the Afghan Embassy denied press reports that Afghan had halted the survey before it was completed. Recently the Soviet government had protested the fact that the work was being conducted close to the Soviet-Afghan border.

INDIA—Requirements of sulphur now estimated at 67,500 tons per annum are likely to be increased to 90,000 tons within the next few years. The government has decided that there is no prospect of India's becoming self-sufficient in sulphur and, therefore, has advised manufacturers of sulphuric acid to install special burners for burning pyrite instead of sulphur. Pyrite deposits occur in Ajmor, Bihar, Karwar, Bombay, Chittaldrug, Mysore, Tara Devi, Simla Hills and Puga, Kashmir. A Calcutta firm is currently developing the largest of these deposits—at Ajmor. It is said to be the richest in sulphur and also to contain over 1,000,000 tons of pyrite.

TURKEY—Exports of chrome and manganese ore are playing a major role in earning foreign currency for the country. F.o.b. prices are now about $45 per metric ton for chrome and $50 for manganese ore. In October, exports included 2,000 tons of chrome ore to Austria, 9,000 tons to the United States, and 2,000 tons of manganese ore to Yugoslavia. During the first half of last year, foreign currency earnings from chrome ore totaled about T £28,000,000. In 1951 total tonnage exported amounted to nearly 500,000 tons. Chrome ore comes from mines owned by the state-controlled *Eti Bank*. Production in 1951 was 160,000 tons and it is expected to have been surpassed in 1952.

MALAYA—*Tronoh Mines Ltd.* at Perak have celebrated their 50th anniversary by summarizing the changes which have come about in methods and in profits. Efficiency has improved considerably. Tronoh's latest dredge has a bucket capacity of 18 cubic feet which, digging at the rate of 22 a minute, gives a capacity of 350,000 cubic yards a month. This is four times as much as was obtained from the company's first dredge. Tronoh's dredges dig to a depth of 80 feet below the water level; most Malayan dredges will have to operate at this and greater depths. However, in the old days, the average tin content of ground dug by Tronoh was 32.4 pounds per cubic yard, while the average is now 0.56 pounds per cubic yard. Prospecting is hampered by the terrorist operations. Ore sales last year realized £923,648, compared with £971,896 in the previous year.

PAKISTAN—The Geological Survey being undertaken by German experts in 15 different places in the Salt Range in Mianwali and Sarghoda districts has confirmed the presence of iron ore deposits with iron content ranging from 42 to 66 percent. These experts, who undertook the survey at the request of the Pakistan government, will submit their preliminary report shortly. Certain samples were flown to Germany for detailed analysis. The two geologists, Dr. Ing. Hans Ehrenberg and Wolf Henckman, and an engineer, Ing. Filhelm Karlik, believe that about 14,000,000 tons of iron ore have been located within the 100 square miles that they surveyed.

MALAYA—*Rantau Tin Dredging Ltd.* will capitalize $1,450,000 from undistributed profits and will issue shares as a capital bonus to share holders in the proportion of one bonus share for every share held. For the first four months of 1952, the company's two modern electrically operated dredges had an output of 203 tons compared with 121 tons in the first four months of the previous year.

INDIA—The Orissa Mining Areas Development Bill has been passed, providing for imposition and collection of a tax on export conversion or sale of extracted minerals in any mining area. The tax is to be at a rate not exceeding 5 percent of the value of the ore at the pit's mouth of the mines of Orissa. The revenue will be used to provide better communications, water supply, and electricity, and to develop the mining areas. It will also be used to meet the cost of labor personnel and other persons residing or working in the mining areas. The tax is expected to yield an annual revenue of 1,800,000 Rupees. Orissa now supplies most of the iron ore to the Tata mills at Jamshedpur. Rich deposits of manganese, vanadium, iron, chromite, asbestos limestone, soapstone, and graphite are also reported to be found in various parts of the state.

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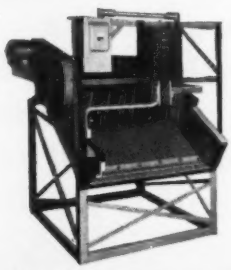

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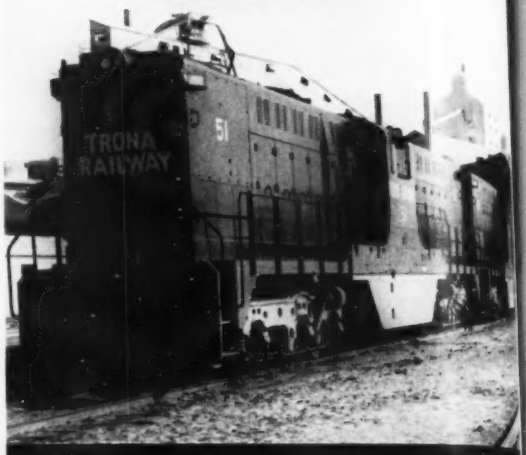

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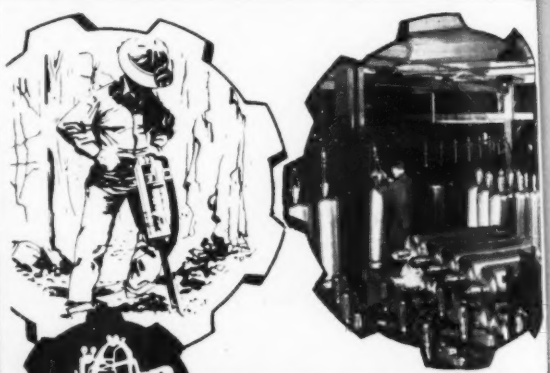

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(Continued from page 47)

inflow from the shaft and headings rose to 720 gallons per minute, so a pump station on the 4,350-foot level was enlarged to handle an inflow in excess of the actual. Simultaneously, preparation for grouting was started in the two development headings in accordance with the usual "cover" plan. Suddenly the water-inflow increased, then surged to 1,580 gallons per minute, and started to flood the shaft because pump capacity was too small to hold the water level.

This sudden inflow was all the more unusual because the No. 1 shaft, some two miles north, reached a depth of 5,345 feet on January 1, 1953 with little water encountered during the last three months sinking with the last 269 feet being in the footwall below the Basal Reef.

The engineers immediately made plans to recover the shaft. It was decided that the best method would be to cement off the water in the shaft, and to permit it to rise to a point where equilibrium would be reached between the inflow pressure and the static pressure. In order to salvage equipment, motors, and pumps in the several pumping stations ahead of the rising water, it was necessary to slow the rate of water rise in the shaft by bailing.

Pumping Water Into Mine

As soon as salvage had been completed, pumping of surface water into the shaft was started to speed the time when the pressure head in the shaft equalled the inflow pressure at the shaft bottom. In-pumping started on September 16 at a initial rate of 300 gallons per minute. Within three weeks, 1,330 gallons of surface water per minute were dropped into the shaft. When the water reached a point 399 feet below the collar, pumping of cement into the bottom of the shaft was started through one of the shaft's pipe lines. A test bucket lowered to the bottom and then raised to the surface showed by its cement content that the water inflow rate was too great to permit cement placement and setting. Cementation was stopped and in-water pumping continued. On October 6, the water level was only 52 feet below the collar and a reversal of water flow was noted. The static head was greater than the inflow pressure, affording a good opportunity for cementation. The first heading was then filled with 3,013 buckets** of cement. Before cementation, 835 gallons of water per minute were pumped out of the shaft. This dropped to 600 gallons and remained constant for 10 hours indicating successful sealing of the heading. On October 7, cementation of the other heading was started. Within 24 hours, the rate of inflow had dropped to 330 gallons and remained constant for six hours, at which time it was considered that cementation was successful, 3,999 buckets of cement had been used in the second heading.

To all appearances, the fissures had been sealed, but the engineers knew the danger that would result as the shaft was pumped out and the pressure on the plugs reduced. Accordingly, 34 pumps of different makes and capacities were assembled. The largest individual pump had a rated capacity of 660 gallons per minute at a 3,000-foot head.

On October 10, bailing was started in four compartments with 1,300-gallon bailers. Two bailers were handled by each of the two hoists. Bailing was 1,000 gallons per minute, almost three times the inflow rate. As the water level was lowered, pump stations with a 1,600-gallon-per-minute capacity were established at 1,000-foot intervals. Bailing was delayed at each station because an existing station had to be enlarged or a new station cut. The main pump station on the 3,000-foot level was enlarged, and five 660-gallon-per-minute pumps were installed in 18 days. The lowest station established and equipped was on the 4,750-foot level.

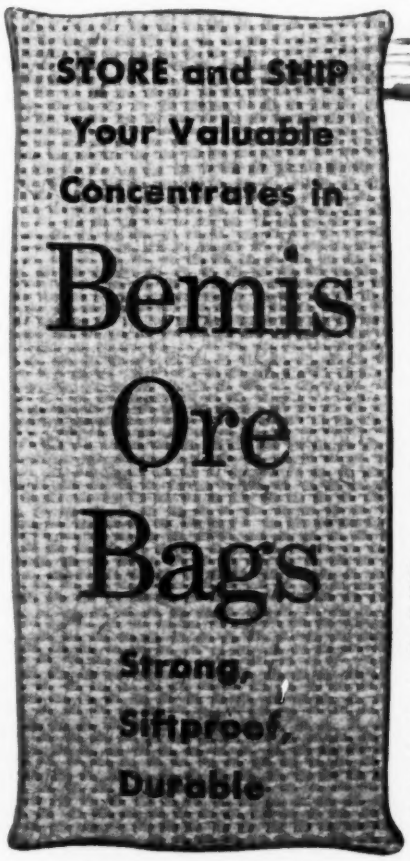
The shaft was then bailed out to the 5,350-foot level where plans had been made to install five 1,660 gallon-per-minute pumps to pump directly into the main 3,000-foot station. However, on January 6 a second heavy inrush of water flooded the shaft. Fears that the plugs would not withstand the inflow pressures had been justified.

Bottom To Be Plugged

It was possible to dismantle the pumping equipment in the various stations and hoist it to the surface ahead of the rising water. The water rose to about the same distance from the surface the second time before equilibrium was established late in January. The time was much less because there was no delay in starting to pump water from the surface into the shaft.

Plans have been made to seal off the shaft at the 5,350-foot level, and to pour a plug to the bottom. Further development will be done from the higher levels.

** Each bucket contains 94 pounds of cement.



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COPPER:	Electrolytic. Delivered F.o.b. cars, destination U.S.A.	24.5[illegible]
	Lake. Delivered, destinations U.S.A.	24.42[illegible]
	Foreign Copper. New York	36.00-36.5[illegible]
LEAD:	Common Grade. New York	13.5[illegible]
	Tri-State Concentrates, jig, flotation 80% lead, per ton	$166.3[illegible]
ZINC:	Prime Western. East St. Louis	11.5[illegible]
	Tri-State Concentrate, 60% zinc, per ton	$76.0[illegible]
ALUMINUM:	Primary 30 pound Ingots (99% plus). F.o.b. shipping points	20.5[illegible]
ANTIMONY:	Lone Star Brand. F.o.b. Laredo, in bulk	24.5[illegible]
BISMUTH:	(In ton lots) price per pound	$2.2[illegible]
CADMIUM:	Sticks and bars. 1 to 5 ton lots (Price per pound)	$2.0[illegible]
COBALT:	97-99%, keg of 550 pounds (Price per pound)	$2.4[illegible]
MAGNESIUM:	Ingots (99.8%). F.o.b. Freeport, Texas	24.5[illegible]
MERCURY:	Flasks. Small lots, New York	$213.00-$215.0[illegible]
NICKEL:	"F" Ingots (5 pounds). F.o.b. refinery, Port Colburne, Ontario	60.0[illegible]
TIN:	Grade A Brands. New York (Price per pound)	121.5[illegible]
TITANIUM:	99.3% + (Price per pound)	$5.00-$7.5[illegible]
GOLD:	United States Treasury price	$35.00 per ounce
SILVER:	Newly mined domestic. United States Treasury price	90½¢ per ounce
	Foreign Handy & Harman	85.25¢ per ounce
PLATINUM:		$90.00-$93.00 per ounce

ORES AND CONCENTRATES

BERYLLIUM ORE:	10 to 12% BeO. F.o.b. mine, Colorado	$43.00 per unit
	Small lot purchases at Custer, S. D., Spruce Pine, N. C., and Franklin, N. H. Visual inspection at $400.00 per short ton or by assaying at: 8.[illegible] to 8.9% BeO, $40 per unit; 9.0 to 9.9%, $45; over 10.0% $50.	
CHROME ORE:	F.o.b. railroad cars eastern seaports. Long tons dry weight.	
	African (Rhodesian). 48% Cr_2O_3	$44.00-$46.00
	African (Transvaal). 48% Cr_2O_3.	$34.00-$35.00
	Turkish. 48% Cr_2O_3. 3 to 1 chrome-iron ratio	$54.00-$56.00
	U. S. Government ore purchase depot Grants Pass, Oregon, Base price lumpy ore, $110.00 for 48% Cr_2O_3 ore a 3 to 1 chromium-iron ratio. Premiums for higher grade ore and for a ratio up to 3.5 to 1. Penalties for grades down to 42% Cr_2O_3.	
COLUMBIUM-TANTALUM ORE:	At small lot beryl purchase depots. $3.40 per pound contained combined pentoxides in 50% ore.	
IRON ORE:	Lake Superior. Per gross ton Lower Lake Ports.	
	Mesabi, Non Bessemer, 51.5% Fe	$ 9.05
	Mesabi, Bessemer, 51.5% Fe	$ 9.20
	Old Range, Non Bessemer	$ 9.20
	Old Range, Bessemer	$ 9.45
MANGANESE ORE:	Metallurgical grade. 46 to 48% Mn. Long ton unit	$1.20-$1.22
	Chemical grade. 80% MnO_2. Per ton	$70.00
	U. S. Government ore purchasing depots: Deming, New Mexico; base price $2.30 per long dry ton unit of recoverable manganese less handling and treatment costs. Wenden, Arizona; base price of $8.54 per long dry ton of 15% manganese ore. Butte, Montana; (black and pink ores) base prices of $4.87 per long dry ton of 18% manganese ore. Phillipsburg, Montana; base price of $6.43 per long dry ton unit of 15% manganese ore. Small lot program f.o.b. railroad cars, minimum 40% Mn. Base price (48%) $2.30 per unit with premiums and penalties.	
MOLYBDENUM CONCENTRATE:	90% MoS_2. F.o.b. Climax, Colorado. Per pound of contained molybdenum, plus cost of containers	$1.00
TUNGSTEN CONCENTRATE:	60% WO_3. Per short ton unit	$65.00
URANIUM ORE:	Carnotite-Roscoelite. F.o.b. purchase depot plus $0.06 per ton mile ($6.00 maximum), Grand Junction, Rifle, Durango, Naturita, and Uravan, Colorado. Salt Lake City, Marysvale, Thompsons, and Monticello, Utah. Shiprock, New Mexico, Edgemont, S. Dakota. Base price for 0.10% ore is $1.50 per pound and up to $3.50 per pound of contained U_3O_8 plus $0.75 per pound for each pound in excess of 4 pounds per short dry ton and an extra allowance of $0.25 per pound for each in excess of 10 pounds. A $0.50 per pound development allowance paid on all ores purchases. At Shiprock all ores with more than 6% lime are penalized for excess lime.	
VANADIUM ORE:	Carnotite-Roscoelite. V_2O_5 in ratio of more than 10 parts to 1 part of U_3O_8 are generally acceptable at all AEC depots, but excess not paid for at Marysvale, Monticello and Shiprock. . . . Per Pound V_2O_5	$0.31

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	Acid grade. 97% CaF_2	$60.00
PERLITE:	Crude: F.o.b. mine per short ton	$3.00 to $5.00
	Plaster grades. Crushed and sized. F.o.b. plants	$7.00 to $9.00
SULPHUR:	Long ton, F.o.b. Gulf Coast mines	$22.00

Quotations on metals and certain ores through the courtesy of *American Metal Market*, New York, N.Y.

ENGINEERING BOOKS:

Views and Reviews

MINERALS—A KEY TO SOVIET POWER. By Demitri B. Shimkin, Harvard University Press. 1953. 452 pages, 101 tables, numerous maps and charts, cloth bound, 8.5 by 5.5 inches, $8.00.

The September and November 1951 issues of *Mining World* contained preliminary portions of this comprehensive report on the systematic survey of the mineral resources, production, and consumption of the Union of Soviet Socialist Republics. The period covered is 1926 through 1950.

The nine chapter titles are: Introduction; Sources and Definitions; Ferrous Metals; Nonferrous Metals; Gold; Coal and Lignite; Petroleum, Natural Gas, and Anthracite; Nonmetallic Minerals Other Than Fuels; The Development and Potentials of Russia's Mining Industries.

The volume surveys thoroughly for each mineral the following: production, foreign trade, consumption and utilization patterns, reserves and deposit geology. This detailed survey of the U. S. S. R. is supplemented by a brief review of satellite output and reserves. Dr. Shimkin discusses the formidable problems of the adequacy of Soviet production and reserves as related to economic growth and potentialities for self-sufficiency to 1970.

It is a reference book of wide interest to all mineral industry personnel. The extensive bibliography and index of place names is especially valuable to those interested in Russia.

Publication of the book was made possible by the Russian Research Center of which Mr. Shimkin is a member. The major purpose of the center is the study of the Russian institutions and behavior in an effort to make for better understanding of international actions and policy of the Soviet Union.

MANUAL OF PHOTOGRAMMETRY, American Society of Photogrammetry, Washington, D. C. 1952, illustrated, 800 pp., $12.50.

This is a new handbook, written by carefully selected authorities, covering 20 chapters. It includes: aerial cameras and accessories, aerial photography, photographic materials and laboratory techniques, radial triangulation, preparation of mosaics, photographic interpretation, stereoscopy, map compilation, mapping from oblique photographs, and planning for photographic mapping.

Photogrammetry is the art or science of measuring photographs, not only metrically, but geometrically. Though 100 years old this year, it is one of the most significant, practicable developments to come out of World War II which has an immediate application.

This manual is a unique and comprehensive collection of practical operating instructions and engineering fundamentals of photogrammetry. It includes references to all the important applications of the science as currently employed in the United States. Of primary importance is the fact that the manual provides in one volume, for the use of professional workers in photogrammetry, the current United States practices for construction of maps including large-scale engineering-type plans, standard topographic quadrangles, and small-scale reconnaissance and planning charts.

Copies of any of these books may be purchased from *Mining World*, 121 Second Street, San Francisco.

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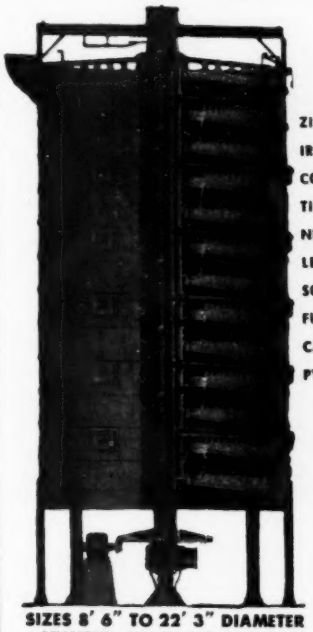

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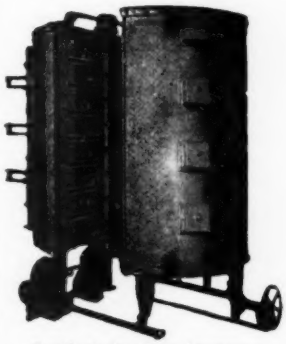

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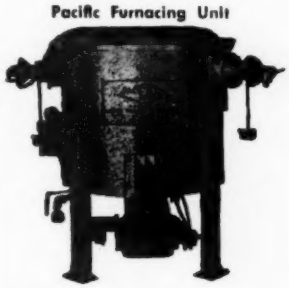

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PRODUCTION EQUIPMENT PREVIEW

PEP is just what new equipment, increased mechanization, and new methods can give to your mine, mill, or smelter. This PEP section is MINING WORLD'S way of making available to you some of the latest current information on mechanization.

Dust Collector Cleans Bolt Holes While Drilling

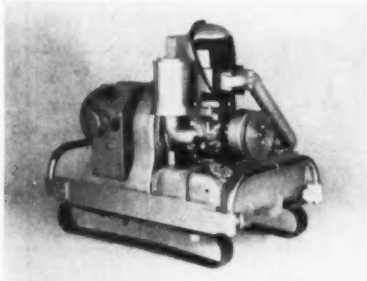
A new dust collector, driven by mechanical, electrical, or compressed air power, has been developed by Mine Safety Appliances Company to clean bolt holes as they are being drilled.

The new unit cleans holes driven at any angle, does away with the need for water hose, and yet prevents the production of ambient dust. One drill manufacturer is installing these collectors on all its roof-bolting drills as standard equipment and others have expressed interest in similar arrangements. MSA bulletin no. 1504-1 has full details. To get a copy, circle no. 73.

Portable Generator Offers Power Versatility

A new dual-voltage generator made by the Homelite Corporation will carry a continuous 5kw, single-phase, 60-cycle alternating current at either 115 or 230 volts.

Though the complete unit weighs but 228 pounds, it will furnish power for a variety of tools and equipment and provide power for emergency lighting. With a rugged, one-cylinder, air cooled, 2-cycle gasoline engine and high resistance to oil, moisture, and abrasive dust, the generator is always available for any application. For further information, circle no. 77.



Safety Set to Sound Means More to Miners

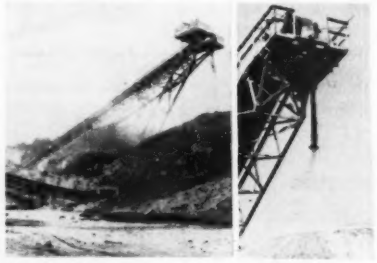
Miners can avoid reading safety messages, but they can't avoid hearing them with the use of the new Message-Repeater made by the Mohawk Business Machines Corporation. Only six inches in length and weighing under six pounds, the unit will repeat recorded messages continuously or at desired intervals. In fact, the gadget can be set to repeat its message whenever an activating device such as a photo-electric cell or floor switch makes contact.

Messages are recorded simply by speaking into a microphone—erasure of previous messages is automatic. The recording tape is enclosed in a cartridge the size of a pack of cigarettes. Controls are simple and there are no external reels or tapes. Descriptive literature on this new safety aid will be sent to those circling no. 69.

Telescopic Hose Reduces Dust Losses

In discharging primary crusher product from an elevated belt conveyor to a surge pile, a severe dust problem was created at the Kingston Trap Rock Company of Kingston, N.J. The Thermoid Company was called on and solved the problem by designing a two-section telescopic hose reinforced with wire to prevent collapse and reduce sway.

The hose leads from a hopper at the belt discharge to the top of the surge pile. Cables attached to flange at the lower end of the botom section of the hose, and controlled from the hopper platform, raise or lower the hose discharge as the height of the surge pile changes. Fines can thus be discharged directly on the top of the pile with little or no chance for winds to carry dust over the plant and surrounding area.



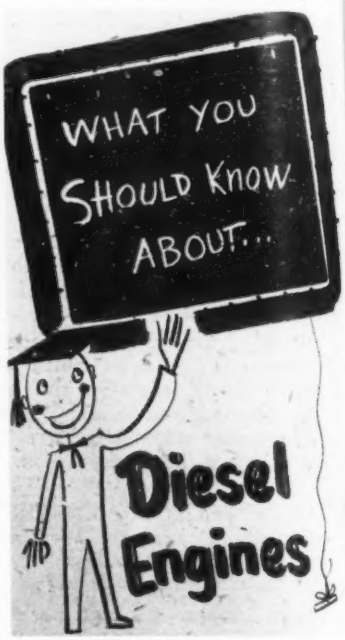
The view on the left shows the dust generated before installation of the hose and the close-up on the right shows the hose in place. Thermoid's engineering service has solved many such industrial problems; for further information and a copy of the company's hose catalog no. 3680, circle no. 70.

IT'S NEW (No.) CIRCLE IT

New Engine Booklet Describes the Diesel

The basic design features, history and development of the Diesel engines are explained in text, graphs, and illustrations in a book recently published by the Harnischfeger Corporation.

Comparisons between Diesel and gasoline engines are made in the first part of the bulletin and the differences between 2-cycle and 4-cycle operation are explained in the second. Though designed as a Diesel "primer," this new P&H publication has enough well-illustrated details of Diesel design and maintenance to satisfy the experienced mechanic or operator. To get a free copy of the booklet, circle no. 72.



Front End Loaders Use 4-Wheel Power Steering

Featuring an entirely new development in smooth, flexible power, two new models of Scoopmobiles employ a new principle of construction by hinging two power axle elements together with an oscillating center-pin coupling. With this arangement, full power is retained on all four wheels in any degree of the turning radius.

Faster loading is provided by an exceptional break-out action on the hydraulically operated loading bucket. The reversing transmission has 8 speeds forward and back and Diesel power is optional at extra cost. Circle no. 79.

BUTTERFLIES IN THE LINE: Maybe that's what you need in your liquid, sludge, or dry material lines. If so, the Keystone Tool Corporation make a butterfly valve especially designed for the purpose. It seals against any pressure from a vacuum to 150 psi. For complete details, circle no. 16.

HELICAL GEARS AND HOW THEY WORK: Helical gear drives—their advantages, fields of application, and correct selection—are discussed in a 16-page book just released by the Link-Belt Company. Circle no. 17.

GAS TURBINES: "The Combusion Gas Turbine and Its Application" is the title of a new release by General Electric. It discusses the theory and uses to which turbines have been put as well as possible uses for future models. Power generators, locomotives, and pipeline pumping are some of the successful present installations. For a copy, circle no. 18.

INDUSTRIAL V-BELT DATA: Thermoid has a new book describing their v-belts and giving conversion tables for fast, correct replacements. To obtain a copy, circle no. 19.

SMALL POWER SHOVELS: Link-Belt Speeder Corporation just published a new catalog on their latest Series 51 (½-yard) shovel-cranes. These crawler-mounted units are quickly converted to draglines, clamshells, trench hoes, or pile drivers. To get a copy of Series 51 catalog, circle no. 20.

WHAT IS THIS THING CALLED TORQUE? If you want to find out, send for the new manual, "Coupling or Converter?" published by the Twin Disc Clutch Company. It is, as they claim, a source of clear, solid facts stripped of technical jaw-breakers. Circle no. 21.

TACONITE PELLETS HARDENED: Though tests have not yet been completed, an interim report on Allis-Chalmers' work on the heat hardening of taconite pellets from the Babbitt plant of the Reserve Mining Company was given at a Duluth, Minnesota meeting of the AIME in January. If you'd care to get the full information on this development when it becomes available, circle no. 22.

PINCH-TYPE VALVES: Flexible valves —like the ones used in labs on rubber hose, only bigger—have the advantages of full pipe capacity, eliminating water hammer, absorbing vibration and misalignment, and long wear on abrasive materials. They're the answer to sand line problems. Get Flexible Valve Corporation's catalog on their complete line of these valves by writing them at 620 Commercial Avenue, Palisades Park, N. J. Or circle no. 2.

CONVEYOR WALKOVERS: The Ballymore Company makes two types of ladders designed to make accessible the areas above and beyond conveyor installations. Built something on the order of the old fashioned stile, one type has rubber tipped legs for permanent or semi-permanent service and the other has casters. For prices and specifications, circle no. 3.

IMPROVED GYRATORY: Kennedy-Van Saun's new high-torque, non-clogging gyratory will efficiently handle tough rock with as much as 50 percent clay. Get the full information on this new development by circling no. 4.

PERIODICAL FOR THE LAB MAN: The Eberbach and Son Company, makers of all types of scientific equipment, publishes a periodical they call the "Announcer." It's packed with all kinds of interesting info—for instance, the current issue features an automatic wash bottle without a mouthpiece tube. If you'd like to get on Eberbach's mailing list to receive the Announcer, just circle no. 5.

DIAMOND DRILL BULLETIN: E. J. Longyear Company has a new general bulletin 86 featuring diamond core drills and the new Arvela precision magnetometer. To get a copy, circle no. 46.

HEAVY-DUTY WATER HOSE: A new four-page catalog on heavy-duty hose for either air or water service has been published by the B. F. Goodrich Company. Standard and various types of specialized hose designed for high pressure are described. Circle no. 7.

WIRE ROPE SLINGS: For the mine manager using packaged timber, a new Leschen book on wire rope slings and how to use them will prove invaluable. This 64-page publication is packed with illustrations, tables, and graphs showing the best of sling practice. Circle no. 8.

ENGINEERING DATA: "Lefax" has become synonymous with engineering data books. They've now announced a new catalog on their latest issues. These field-notebook-size sheets sell for $1.00 a set and cover nearly every subject in the field of engineering. To get the new Lefax catalog, circle no. 9.

SHARPENING INSERT BITS: The latest information on when and how to sharpen tungsten carbide mining tools, and the equipment used, is covered in a new 26-page manual published by Carboloy Department of General Electric. Circle no. 10.

AIR VALVES: Ledeen Manufacturing Company has issued a bulletin describing and illustrating the complete line of Ledeen valves for operating air and hydraulic cylinders and air motors. Get a copy by circling no. 11.

LONG WEAR TIRES: The Goodyear Tire and Rubber Company has announced the basic patents on an entirely new type of synthetic rubber that is predicted to give the tire of the future wearing qualities now unobtainable. In fact, tires may someday outwear the truck or car. For more information, circle no. 12.

SHOVEL MANUAL: A 32-page book published by the Koehring Company is a truly valuable and complete guide to the "Use and Application of Power Cranes and Shovels." From basic principles to detailed cost records, it covers every phase of crane and shovel use. For a free copy, circle no. 13.

BETTER HOUSEKEEPING: Dust in a crushing plant is often a serious and costly problem. For the latest dope on efficient dust control in mills and plants, send for a copy of the new 20-page booklet published by the Lamson Corporation by circling no. 14.

Circle numbers and mail this card for free product literature

To get further information on any item described in the Production Equipment Preview, note the key number of that item, circle the corresponding number on the PEP card at the right, and mail. If mailed from a point outside the United States, proper postage must be used.

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BIGGER PAYLOADS: The big 30-ton Athey Wagons will handle rock of nearly any size—if a shovel can pick it up, an Athey can haul it—and heavy construction records are being set with these rigs wherever rock is hauled. More complete information to those circling no. 23.

BIGGER CHURN DRILL: Bucyrus-Erie now makes a big churn drill, the 50-T, that drills 9- to 12-inch holes and will handle a tool string up to 6,000 pounds. All this adds up to faster drilling and greater depth for the churn driller. Circle no. 45.

FASTER FEEDING AT LOWER COST: Stephens-Adamson steel pan feeders have been designed expressly for feeding high volumes of heavy, abrasive ore and rock to scalping screens and primary crushers, one of mining's most punishing jobs. Find out more about S-A pan feeders by circling no. 52.

HANDLE THICK SLURRIES? If you do, and especially if the slurry is high gravity, find out how Morris Type R slurry pumps can give you longer operating life with little or no maintenance. Get Morris bulletin 181 by circling no. 47.

LUBRIPLATE SOLVES PROBLEMS: According to the Stephens-Adamson Manufacturing Company, there has not been a single case of conveyor roller failure due to faulty lubrication where Fiske Brothers Refining Company's Lubriplate has been used. To find out more, get the new 56-page treatise on lubrication published by Fiske. Circle no. 48.

100 PENNIES MAKE A DOLLAR: And little repeating costs add up to a lot of expense. Take cheek plates, for instance. First cost isn't great but continual replacement means lost time and money. With Resisto-Loy's N. M. Mangatone, cheek plates can be surfaced to give longer life and lower costs. Circle no. 49.

ROTARY FINE CRUSHING: If crushing or granulating to fine, even sizes without clogging or excessive dust is one of your problems, Sturtevant's rotary fine crushers are your answer. Send for Sturtevant rotary crusher catalog by circling no. 50.

ROCK-RUGGED BODIES: Heil truck bodies are built to withstand the punishment of handling heavy rock loaded with big buckets. For more information on these fast-acting, rock-rugged boxes, circle no. 51.

CRANE POWER: The Cummins-powered crawler-mounted Manitowoc Speedcrane is a high-speed, heavy-duty crane designed for fast service in lifting and moving. For further details on this and other applications of Cummins Diesel power, in construction and mining, circle no. 27.

NO-PUSHBEAM BULLDOZER: The Baker Manufacturing Company in cooperation with Allis-Chalmers developed the first successful application of no-push-beam dozer design. They now have a second similar but much bigger unit that mounts on an HD-15. This unique design transfers more power to the blade, affords better ground clearance, and makes bulldozing faster. For further information, circle no. 28.

BETTER POWER BELTS: B. F. Goodrich makes a new rubber transmission belt with all rayon fabric, said to give 25 percent greater strength, ten times longer flex life, and 50 percent less stretch than conventional cotton fabric belts. For the full dope on these Drivesall belts, circle no. 29.

VERSATILE DIESEL LINE: A new brochure describes six International Diesel engines ranging from 45 to 180 hp. and various applications where these engines have been outstandingly successful. Circle no. 30.

ROAD-RAIL POWER: "Reports From the Field" on Trackmobiles, the powerful little towers that convert almost instantly from rail to road transportation, shows the savings in time and money that they have given to industry. Circle no. 31.

SCRAPER MOVIE: Euclid Road Machinery Company has released a new 16mm color cinema production starring the Twin-Power Scraper. For information on obtaining this and previous Euclid movies, circle no. 32.

LEASE LIFT TRUCKS: Lift and fork trucks made by the Yale and Towne Manufacturing Company can now be leased rather than purchased. Through arrangements recently made with the C.I.T. Corporation, these units are available to those who require them for a limited time but cannot meet the capital investment r quired by outright purchase. Circle no.

COST-CUTTING MANUAL: The Stoo Company has released a revised edi of its famous Hard-Facing Guide Bo It covers procedures for all types of ha equipment—methods developed and u today by maintenance men all over t country. Circle no. 38.

BETTER GRINDING WITH LE POWER: Traylor mills are built with ne Meehanite bearings to overcome the we problems caused by excessive starti torque. For full information on the a vantages and uses of Traylor ball, ro and compartment mills, get Traylor Bu letin 7121 by circling no. 39.

EAGER DRIFTER: That's what Gardne Denver calls their 3½-inch 93. It's a ne machine for which is claimed the powe and performance of the usual 4-in drifter. Bulletin DD-2 gives complet specifications. Circle no. 40.

REDUCE FROTHER: Dow claims for t Dowfroth 250 less frother consumption lower-cost flotation, and improved meta lurgy. Test their claims on your ow operations by getting a free sample. Circl no. 41.

ORE TESTING SERVICE: The Galigh Company has a complete ore testing ser ice. Get the full details on obtaining th service for your ore by circling no. 42.

SMELTING ON SITE: Mace furnace and sintering hearths save high transpo tation and treatment charges on your ore and concentrates by smelting at the min or mill site. Get the new Mace catalo by circling no. 43.

TONNAGE GOING UP: And costs g down with the new Le Roi-Cleveland ai feed drifters. With fast reversing an quick set-ups, these machines are proving to be truly valuable mining tools. Circl no. 44.

EASIER PIPING: The United States Rub ber Company has a brochure available that explains in detail the application design, installation, and use of the new Uscolite plastic pipe and fittings. Get a copy by circling no. 26.

For Free Product Literature, see other side

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Bantam Offers Heavy-Duty Truck-Mounted Crane

The new Bantam model T-35 is an improved shovel-crane with a complete line of attachments, including shovel, crane,

clamshell, dragline, back hoe, magnet, wood grapple, and pile driver.

Among the many improvements over previous models are a stronger main frame, larger shafts and bearings throughout, bigger center pin, new trunnion base with wider trunnion rollers, twice as much radial load, increased clutch and braking surfaces, power lowering control levers located to reduce operator fatigue, better operator visibility, better ventilation, and safety glass for better operator protection.

The new model T-35 can be mounted on any new or used tandem-axle truck having a wheelbase of 164 inches or more, or a suitable single axle truck where ground conditions are favorable. Or the unit can be mounted on pedestals, barges, trailers, etc., to increase the machine's work range. According to the maker, mass production of a single size machine makes the unit the lowest priced machine of its size and type. For a price list and further details, circle no. 71.

Hauler Fleet Built Of High Strength Steel

Euclid has just completed for the Hanna Coal Company a fleet of the biggest haul units ever constructed by the firm. These 47-ton units are built of special high strength alloy steel and have a

capacity of 62 cubic yards struck and 70 cubic yards heaped at a 3 to 1 slope.

The new haulers are semi rigs with a tractor powered by a 350-hp. Diesel engine. The trailer is spring mounted and the tractor has dual drivers; nylon cord tires of 28 ply rating are used on both. Other features include 10-speed transmission, air assist clutch, and hydraulic booster steering. For more information on Euclids big haulers, circle no. 78.

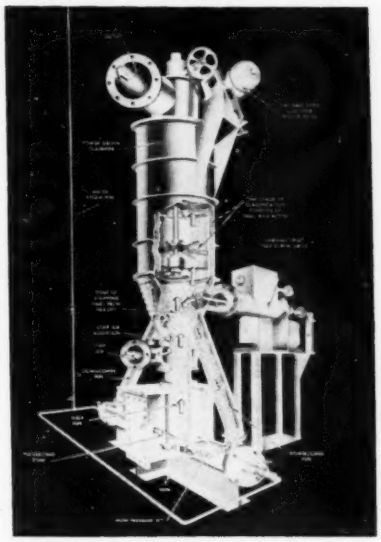
IT'S FREE (No.) CIRCLE IT

IT'S FREE (No.) CIRCLE IT

Majac Releases Bulletin On Industrial Pulverizing

"The New Art in Industrial Pulverizing" is the title of a newly-published booklet by the Majac Engineering Company. Detailed information and technical data on crushing and the engineering, assembly, and operation of the Majac Jet Pulverizer are included.

A large cutaway fold-out view of the Majac unit showing all component parts under actual working conditions is a part



of the well-illustrated bulletin. To get a copy, circle no. 76.

IT'S NEW (No.) CIRCLE IT

Flexible Electrical Conduit Approved by Underwriters

A new type of conduit developed by the American Brass Company is the first of its kind to be approved by the Underwriters' Laboratories for use in wet locations. Called the "Sealtite" Flexible Elec-

trical Conduit Type UA, this liquid-tight flexible metal conduit has a tough, extruded synthetic covering.

Sealtite Type UA can be cut to required lengths and is light and flexible. Approved fittings are readily available and easy to install. Nominal ID sizes range from ⅜ of an inch to 1¼ inches. For full details, circle no. 75.

Notes From The Manufacturers

E. D. "Don" Tull has been promoted to the newly-created position of vice president and general manager of Cummins Engine Company, Inc. at Columbus, Indiana. He previously was vice president in charge of personnel and plant, and in his new capacity will be responsible for coordinating the work of the five divisions of the company.

George E. (Tex.) Bannister, Hyster Company export representative, is in Europe on a three-month trip that will take him to England, Sweden, Holland, Finland, Norway and Belgium. He will visit Hyster dealers in these countries and assist them in applications of Hyster equipment and modernization of their facilities.

W. A. Finn is new assistant general sales manager of Worthington Corporation, and has set up headquarters in Harrison, New Jersey. Mr. Finn previously was general European manager.

Hubert Fruehauf has been named manufacturing manager for the magnesium department, Dow Chemical Company. Mr. Fruehauf, a mechanical engineer, has been with Dow since 1927, and formerly was manager of the Bay City division. *A. T. Peters*, superintendent of Dow's Bay City foundry, is new assistant manager of the Bay City division; *C. D. Tucker* is now foundry superintendent; and *H. E. Elliott* has been named assistant superintendent.

CRAWLER POWER FOR TIRED TRACTORS: ("Tired" as in "rubber tire," mind you.) Comco, an outfit in Kilgore, Texas, makes what they call the Vice-Grip Retractable Lugs for giving rubber-mounted tractors the traction of crawlers. A set of these gadgets can be mounted in an hour and can be retracted when not needed. Circle no. 33.

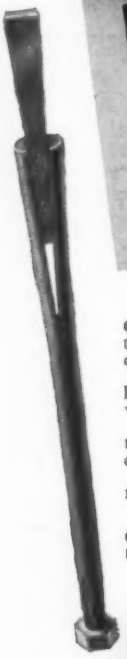
COLD WHERE YOU ARE? Even though Spring is just around the corner, it would be well to investigate the advantages of an improved line of Westinghouse industrial heaters that includes a special model for large plants and mills. Just circle no. 34.

EMERGENCY LIGHT: An emergency light made by the General Scientific Equipment Company provides instant illumination when power fails. Just plug it into any AC circuit, when the power goes off, two big sealed-beam lights provide 10 hours of illumination. Circle no. 35.

CUTTING ELECTRODE: All-State Welding Alloys Company has announced a new electrode that cuts, chamfers, bevels, pierces, and gouges up to 2½ times faster at the same heat without the use of gases. Circle no. 36.

NEW PILLOW BLOCK: The Dodge Manufacturing Corporation and the Timken Roller Bearing Company have combined know-how to develop a new and better pillow block to be used in industry's heaviest and most difficult tasks. Circle no. 37.

CF&I STEEL PRODUCTS FOR THE MINING INDUSTRY



INVESTIGATE ROCK BOLTS ...for your own mining operation

CF&I Rock Bolts for Safety... Economy... Better Housekeeping

CF&I Rock Bolts afford support within a few inches of the face or heading, and blasting has little or no effect on the bolts. They give better support than timbering.

Rock bolts store in less space and greatly reduce handling and transportation costs. They require less work to install—last indefinitely.

Rock bolts provide more clearance overhead and on the sides. Ventilation is improved by the elimination of caps and posts.

Investigate the use of CF&I Rock Bolts for your own mining operation.

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THE COLORADO FUEL AND IRON CORPORATION, DENVER and NEW YORK

ROCK BOLTS CF&I
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1123

For high recovery content

Hendrick Wedge-Slot Screens have very small openings yet have greater draining and screening capacity. They retain material that would ordinarily be wasted or cause expensive time delays for reprocessing.

Profile bars are shaped to maintain uniform width of slot openings as wear progresses. Long screen service life and constant ore quality are always maintained. Let us know your particular operating methods and we'll be glad to recommend the right Hendrick Wedge-Slot Screen for your specific needs.

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LURKING DANGERS

When president Truman appointed the government task force with orders to formulate plans for placing the Paley Commission's recommendations in operation it was feared that he might force the changes upon the mining industry by executive order. This danger is past, but it is well to remember that most of the bureaucrats who have proposed these changes during the past 20 years are still actively in office. As they now have all their desired changes in a favorable position and in one package, we may expect that they will exert full pressure for their adoption. With this danger still facing us, it would seem necessary that our mining industry individually and in association, act promptly with Congress and the Executive so that the Paley report (Resources For Freedom) may be placed permanently on the shelf.

There is one article in the report that has not had the attention that it deserves. We quote: "That deferral of reporting income from overseas branches until the income is remitted to this country be permitted." This concession for tax-free income from fugitive U. S. dollars, operating with a favorable wage differential, also a favorable freight differential in American-owned vessels operating under Panamanian registry, and with an import tariff favor, poses a fourfold threat that can be, and has been, used to close domestic operations.

In our January 1953 column, we quoted Stalin's instructions to American Communist party members. He cited the steps necessary in carrying through the infiltration tactics in the unions and elsewhere. We do not have to search far to know how successful in the unions it has been, but it is much more wide-spread and much more dangerous. We quote from the *Daily Worker*, page 4, July 27, 1929: "Special attention must be paid to organizing the soldiers for the protection of their own interests, in alliance with the revolutionary proletariat prior to their being called up for service, during the period of military service, and after the conclusion of military services.

"It must be the special task of the trade unions to help form the above-mentioned organizations. The conditions for revolutionary work in armies differ. Revolutionary work in the army must be linked up with the general revolutionary movement of the masses and the poor peasantry."

These are uneasy times. There are far too many unexplained accidents and disasters, both here and abroad, that carry hints of sabotage. They almost might seem to follow a set pattern. Our mining industry is the very foundation of national defense. There is no room for any idea except "AMERICA FIRST." What do you intend to do about it?

'The Wanderer

precipitates—CENTRAL and EASTERN

AEC Initiates Studies For Uranium Recovery

The U.S. Atomic Energy Commission has initiated two studies covering the mining and processing of uranium from bituminous shales found in the southeastern part of the United States. These deposits contain minute percentages of uranium and are of long-range interest to the AEC as a potential domestic uranium reserve.

A small experimental mine will be operated by the U.S. Bureau of Mines, under contract with the AEC, near Sligo, Tennessee. Here the Bureau of Mines will apply its research knowledge and experience gained in mining and processing Western shales to the harder and more refractory Chattanooga shale formation. This formation has a lower oil content than Western shales and has no current economic value. (Western oil shales do not contain uranium.)

A $550,000 contract has been issued to Columbia University in New York, New York, to develop a process for the recovery of the minute percentages of uranium from these shales. The work at Columbia is under the direction of M. D. Hassialis, professor of mineral and engineering and executive director of the School of Mines at the university. It will be conducted in laboratories at Unit No. 1 of the new Engineering Center of Columbia.

Phosphate Industry Plans Florida Expansion Program

The phosphate industry plans to spend $60,000,000 in new construction in Florida, according to Thomas Ware, vice president of the International Minerals and Chemical Corporation. The industry recorded a new high in production in 1952, producing about 10,000,000 tons of phosphate which may rise to 11,000,000 tons in 1953. Florida produced about 8,500,000 tons of this total, says Mr. Ware. IMCC plans to spend about $14,000,000 at the Bonnie plant which will produce superphosphates, plans a new phosphoria mine at a cost of about $8,500,000, and expects to purchase a $1,000,000 "Bigger Digger."

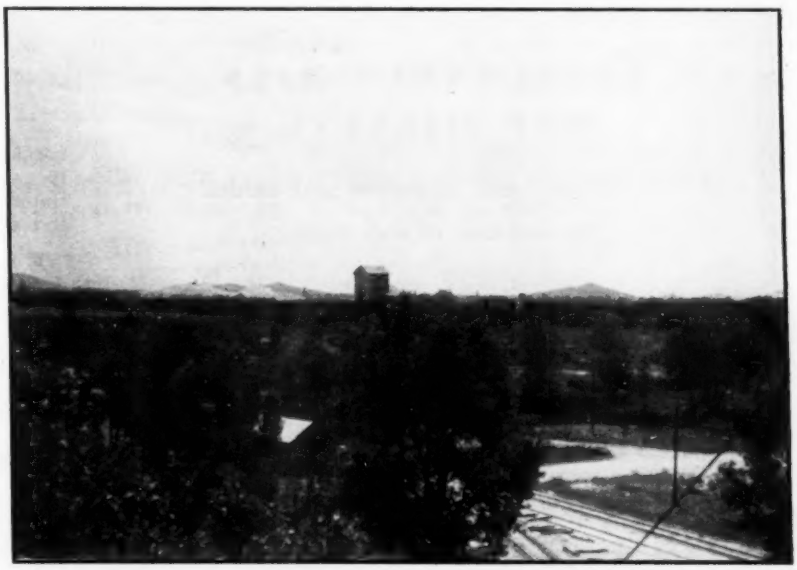
Other companies investing in the area include the Virginia-Carolina Chemical Corporation which has plans for a new $5,000,000 phosphate plant and a $2,000,000 drying and shipping center; the U.S. Phosphoric Division which will spend about $1,500,000 on expansion of three plants and may build a uranium recovery plant; Armour Fertilizer Company which has doubled its expansion program within the year and will start mining operations near the old Morris mine at an approximate cost of $5,500,000; the FS Royster Guano Company which has been issued a $3,500,000 certificate of necessity for a new plant; and Kibbler Company which has spent $125,000 on a new primary washer. The American Cyanamid Company has purchased a $750,000 dragline and is working on an extensive reclamation program. Swift & Company has doubled its capacity at a cost of $1,500,000, while the Davison Chemical Corporation will spend $12,000,000 in expansion and production of triple phosphate in addition to buying a new $750,000 dragline.

The *Homestead Mining Company* of Platteville, Wisconsin is making a complete change in crushing equipment at its mill. The Bulldog Non-Clogging hammer mill, vibrating screen, and conveyors reportedly were incapable of handling the wet, clayey ore indigenous to that district and have been removed. In their place, Homestake is installing a Lipton 36-inch by 18-inch jaw crusher which will crush all mine ore without grizzlying. Secondary crushing will be done by a 30-inch by 18-inch set of Telsmith rolls. All material from the first set of rolls will be fed to a 36-inch by 8-foot trommel screen which will send the oversize to 24-inch by 14-inch Galena Iron Works rolls, and the undersize will go to a drag which will feed the jigs. During the changeover, all mine ore is being stockpiled underground.

Freeport Sulphur Company plans to develop a new sulphur project in the Louisiana marshland. Known as *Chacahoula*, the dome is located in Lafourche Parish, about 60 miles west of New Orleans. The company has been diamond drilling in the area since last April.

Amco Exploration, Inc., a subsidiary of *American Metal Company*, reportedly has requested mineral rights to a large tract of land on the north shore of Lake Lawtonka near Lawton, Oklahoma. The firm is said to have made an offer to the city council for removal of ilmenite from the alluvial sand at the lake, and to have indicated that it would be willing to establish a processing plant.

The *United States Steel Company* is reported to have purchased land in the town of Canton, New York from the *Agawam Iron Mining Company* for $80,-



EAGLE-PICHER ACQUIRES BILHARZ

The Mining and Smelting Division of the Eagle-Picher Company has purchased the assets of the Bilharz Mining Company. Bilharz has long been one of the leading independent Tri-State mining companies and operated the Muncie, Northern, and Southern leases in Cherokee County, Kansas. All lead-zinc ore from the Bilharz mines has been treated for some time at Eagle-Picher's Central mill at Commerce, Oklahoma. Daily ore shipments were made by rail from the Muncie mine to the Central mill. The picture above was taken looking southeast from the Muncie mine "derrick." The "derrick" in the center is over another lead-zinc shaft. The lease area covered by the agreement is in the immediate foreground and includes the shaft. The hills in the background are actually piles of "chat" from other milling operations in the vicinity.

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300. About 287 acres are involved in the transaction, all located about one mile north of Pyrites on the east and west sides of the Grasse River. Speculation is that the company may mine iron or chalcopyrite in the area.

The *Tungsten Mining Corporation* in Vance County, North Carolina, was temporarily shutdown in January reportedly because of a dispute with union officials. The company operates the *Hamme* tungsten mine, and recently expanded its mining and milling capacity from 325 to 600 tons per day.

Mangaslag, Inc. has received government assistance for the construction of its new pilot plant to recover ferromanganese from open hearth steel furnace slag. The Defense Materials Procurement Administration has agreed to lend up to $1,000,000 to get the plant going after the company has invested the first $250,000 for the plant. If the process is successful, the firm will repay the loan through sale of 5,000 tons of manganese to the government at $200 per ton. The plant is expected to produce 30 tons of manganese a day from 500 tons of slag. If this can be achieved, the process will be worth commercial development.

The *Southern Dolomite Company* is a new operation in Manatee County, Florida, with a mining area of 191 acres, and a processing plant with a daily capacity of 250 tons. Mining is by open pit. The blasted dolomite rock is loaded by dragline into trucks and carried to the plant to be pulverized and stored for future shipment. R. Eugene Smith is president and general manager of the firm.

United Feldspar & Minerals Corporation, a subsidiary of the *American Encaustic Tiling Company*, has sold its feldspar mine and grinding plant at Oxford, Maine. However, it has retained ownership of the *Bumpus* mine adjoining the feldspar property because it contains the largest known deposit of beryllium ore.

Three feldspar plants using the froth flotation method of recovery are operating in Mitchell County, North Carolina. These are the *Carolina Mineral Company* plants at Kona and Spruce Pine, and the *Feldspar Flotation Company's* plant at Spruce Pine. Three plants are using crude fluorspar from the district in dry-grinding operations. These include a unit of the *Carolina Mineral Company* in the plant at Kona, The *Feldspar Milling Company* at Bowditch in Yancey County, and the *North Carolina Feldspar Producing Company* at Erwin, Tennessee.

IRON RANGES

During the 1952 ore season, the *Ohio* mine of *Cleveland Cliffs Iron Company* commenced shipments of concentrates from the new plant three miles west of Michigamme, Michigan. Ore from the Ohio and *Webster* mines was run through the new concentrator, which consists of crushing, screening, a Wemco HMS Mobil Mill, and Humphreys spirals. This is the first instance of heavy media beneficiation of Marquette Range iron ores. Results are reported as satisfactory.

E. W. Coons Company has dismantled its Humphreys spiral installation at the *Genoa* mine and moved it to the *Julia*

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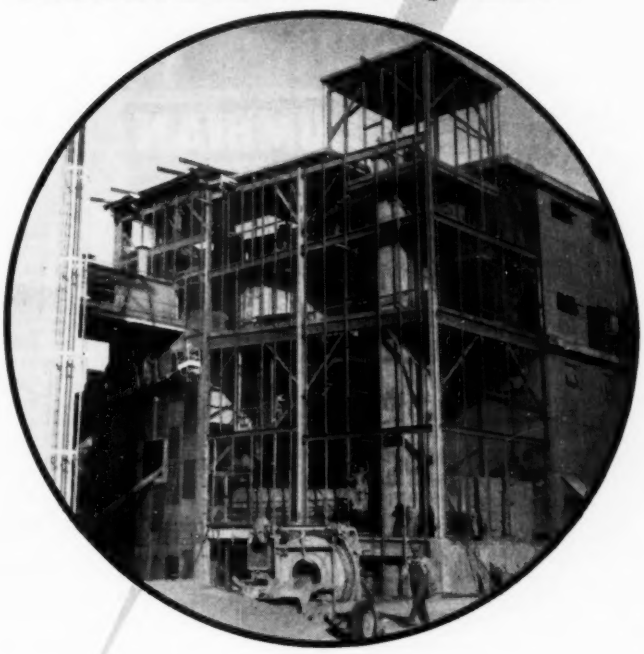

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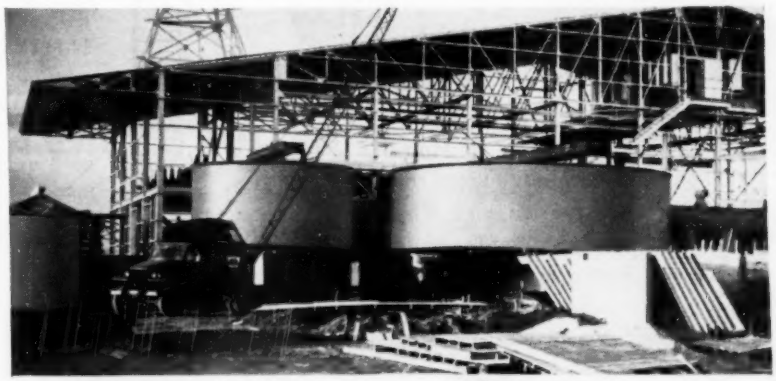

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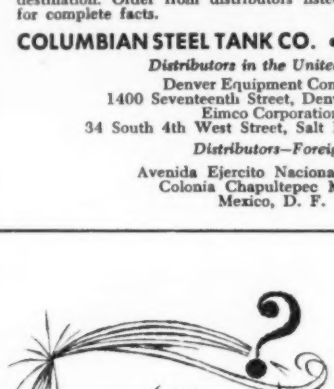

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mine near Virginia, Minnesota, where it will operate to treat the classifier overflow. It is expected that the ore to be treated at the Genoa will be considerably more "fainty" than has been the case in the past, and not as readily treatable with the spirals. To handle the additional washing that will be required by this "fainty" material, Coons has purchased a new 66 inch Wemco classifier which will operate in series with their present classifier to give double washing on the fines. The coarse material will be subject to additional washing in an Allis-Chalmers log washer. Duane Meyers is general superintendent for E. W. Coons. Installation of this new equipment is expected to be completed by the start of the 1953 shipping season.

Preliminary development work in connection with the construction of a second plant, similar to the *Humboldt Mining Company's* plant, is reportedly under way near the town of Republic, just south of Humboldt, Michigan. This property is owned and operated by *Cleveland Cliffs Iron Company*. The date of initial production has not yet been announced.

Erection of the steel for the first section of the *Humboldt Mining Company's* iron ore flotation plant started in January. This plant represents the first full-scale effort to treat low-grade iron ore by the flotation method. U. S. highway No. 41 has been relocated to make way for the open pit which is now in the preliminary stages of development. D. Kelly Campbell is project engineer in charge of the construction for *Cleveland Cliffs Iron Company* who will operate the mine and mill as a joint venture with the *Ford Motor Company*. This plant is scheduled for initial operation during the last quarter of 1953.

Butler Brothers, division of *M. A. Hanna Corporation*, is installing a 125-long-ton-per-hour Dutch State Mines cyclone plant at the Harrison plant just west of Nashwauk, Minnesota. This will be the second cyclone installation by Hanna who pioneered in the use of this process on iron ore with the installation at the *Buckeye*. It is planned to have this new plant ready for operation at the start of the 1953 shipping season.

Construction of the new screening and washing plant at the *Carlz* mine, just east of Keewatin, is continuing by *M. A. Hanna Corporation*. Ore will be conveyed from the pit to the plant which consists of crushing, screening, washing, and hydrosizers. Stripping is being continued concurrently with the plant construction so that the first shipments can be made early this coming season.

The pilot plant being operated by the *Allis Chalmers Manufacturing Company* at Carrollville, Wisconsin to study the problem of heat hardening of pellets made from fine concentrates of low-grade iron ores of Minnesota, Michigan, and elsewhere, has completed a short, but reportedly successful run, and is now shutdown for minor modifications. Ore for the first series of tests consisted of concentrates from the pilot plant of the Reserve Mining Company at Babbitt, Minnesota. Changes are now being made in the ore handling system to permit more efficient handling of material in and out of the plant. The plant is expected to be back in operation shortly.

Several important changes are being made in the Charleson concentrator at Virginia, Minnesota. A second 4-foot Allis Chalmers Hydrocone crusher is being installed in the crushing circuit to increase the capacity of this section, and at the same time permit crushing to a smaller size. Two additional Remer jigs are being installed to recover middlings for regrind. These two additional Remer jigs are being furnished by REMCO of Hibbing, Minnesota, a new corporation formed to manufacture and sell these jigs. The *Charleson Iron Mining Company* is doing this work on the assumption that a considerably lower grade feed will have to be handled in the future. Charleson shipped 246,496 tons during the 1952 season. This compares with 239,578 tons in 1951. Charles H. Remer is vice president and J. C. Henry is superintendent.

Oglebay, Norton & Company, which has occupied the role of managing agent for *Reserve Mining Company* in the development of its taconite mining and concentrating operations at Babbitt and Beaver Bay, Minnesota, has announced that its future association with Reserve will be as consultant and advisor. It will continue in close association with *Republic Steel Corporation* and *Armco Steel Corporation*, co-owners of Reserve Mining Company.

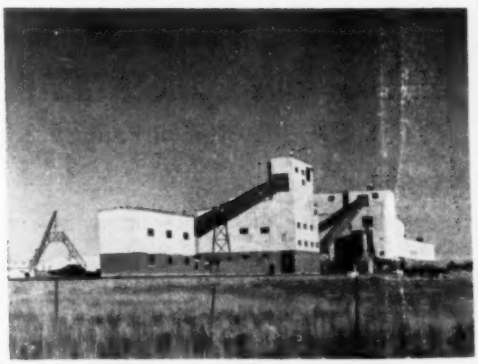
Pickands Mather and Company is installing its first HMS plant to beneficiate Minnesota's Mesabi Range ores. The plant is being built at the *Biwabik* mine of the Picklands Mather-managed *Biwabik Mining Company* at Biwabik, Minnesota. The plant will treat 150 long tons per hour in a No. 4 modified Wemco Mobilmill. Slime will be eliminated before HMS treatment in a washing circuit. J. M. Shields is plant superintendent.

There is a general trend toward making minor repairs and tire changes at pit garages, with major overhauls done at a central garage shop. In line with this trend, the *Minnesota Ore Division* of the *Jones & Laughlin Steel Corporation*, is building an addition to its central garage. The garage is located at the *Longyear* mine near Hibbing, and handles work for all J&L mines from Aurora to Grand Rapids. The addition will provide room for a Clayton Dynamometer (already on hand) which is a machine for testing Diesel truck engines to show the speed and horsepower developed by the engine under simulated working conditions. It indicates when the engine is not up to par, and permits the necessary adjustments to be made before the engine is replaced in the truck. Another new piece of equipment in this central garage is a de-greaser which thoroughly cleans truck parts in a short time. It saves labor and time over hand-cleaning, and does a better job.

The *M. A. Hanna Company's* central laboratory for the Iron River district of Michigan has been moved from its 25-year location in the *Rogers* mine building to the former Homer school in Mineral Hills. The move was made over a weekend without any interruption in the lab's working schedule. The old school has been remodeled into a modern building with two complete laboratory units. W. A. Markert, chief chemist, supervised the transfer.

The *Jones & Laughlin Minnesota Ore Division* has used scotchlite which glows in the dark and is dust-resistant, for the markings on its mine trucks. This is believed to be the first use of scotchlite for this purpose.

Merrick



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COMMISSIONER HEARS GOLD CLAIMANTS; ALL OTHERS MUST FILE BEFORE JULY 14

Sixteen gold mining companies started consolidated testimony before Commissioner William E. Day of the U. S. Court of Claims in Washington, D. C., on January 26. Their testimony concerned damages incurred under the War Production Board's World War II gold mine limitation order L-208 issued on October 4, 1952. This action was not before the full Court as Commissioner Day will present the evidence to the Court later this year. The Court will then rule if governmental liability exists. If it is so found, each claimant will be required to establish the amount of damages incurred.

The actions may be considered a test case. Any gold mine owner who incurred damages as the result of L-208 has until July 14, 1953 to file his claim under the provisions of Public Law 532 —82nd Congress, Chapter 724—2d Session, S. 3195.

In general, the statement of claim should contain the following information: Name of claimant, address, name and address of officers or partners, date and place of incorporation or agreement, location and brief description of mining property, and any changes in title or possession of property since October 8, 1942.

A special statement should include the following, concerning the manner in which owner learned of the order holding his mine to be a nonessential mine: the date on which operations ceased in compliance of order, a brief history of the mine showing expenses incurred in closing mine and a list of expenses sustained during the period of the order which was revoked on June 30, 1945; available evidence to substantiate close-down costs; and, more particularly, did you comply immediately with the order or appeal—if so, what subsequent action was taken?

If the property is now operating, list all expenses incurred incident to resuming operations. If not in operation, estimate cost to rehabilitate property and resume operations. List all other items of damage and facts which should be helpful in preparing a petition for relief.

The Homestake Mining Company is leading the case and its witnesses were Donald McLaughlin, president, and Guy N. Bjorge, vice president. Other witnesses who testified were former WPB employees Shaw Livermore and Dr. Wilbur A. Nelson (WPB Mining Division head in October 1942). Dr. Nelson reported that he did everything possible to prevent the order and that the true reason for the closures was the belief that 10,000 gold miners would be released for other mine employment rather than the shortage of materials reason that the order stated.

The hearing is being watched by other gold miners and ex-gold miners with much interest. Newmont Mining Corporation had lawyers at the hearing representing Empire Star Mines Company, Limited. The Golden Cycle Corporation, the Cresson Consolidated Gold Mining and Milling Company, the United Gold Mines, Inc., and other Golden Cycle-controlled mines operating in Colorado's Cripple Creek district are also interested. The Washington mining firms, Gold Bond Mining Company and Gold Syndicate Corporation, will file claims.

Diamond Drilling Program Starts at New Penn Mines

New Penn Mines, Inc. is making rapid strides in its expansion program at the Penn zinc-copper-gold mine on California's Mother Lode west belt near Campo Seco, Calaveras County, California.

The No. 2 shaft has been dewatered to the 1,200-foot level. A large-scale diamond drilling program is underway to seek additional ore bodies in the wide band of mineralized schist in which a number of lenses of ore have been mined in the footwall of the main Penn vein in recent years. Ore is being mined and hoisted through both the No. 2 and No. 3 inclined shafts and trucked to the nearby differential flotation mill. Mill capacity has been increased to 400 tons per day by the addition of grinding and flotation units.

New Penn was organized in Nevada by the Goldfields American Development Co. Ltd. in 1952 to operate and further develop the famous old Penn mine. W. C. Browning is manager of United States operations for Goldfields American. Edwin H. Oshier is superintendent and Harold Hanson mine foreman.

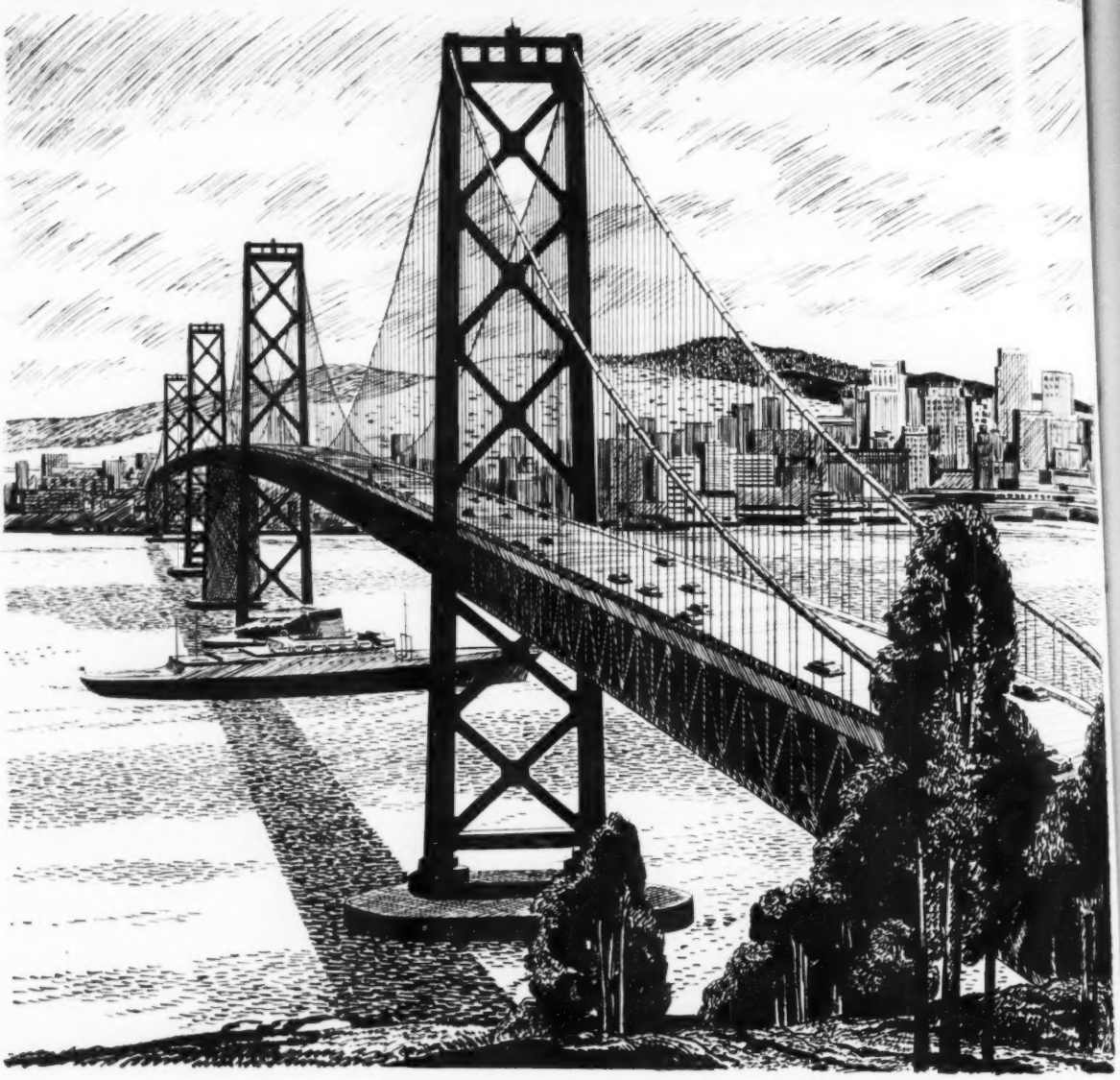
The *Pima Mining Company* is deepening the shaft at its *Alpha* mine to the 600-foot level and plans the thorough exploration of the 500 and 600 levels. The Pima company started development of the mine on January 1, 1952 through

Mining Interests Presenting Claims Before U. S. Court of Claims Starting on January 26, 1953, Their Mines and Locations, Relative Rank in Various Years as Gold Producers, and Amount of Damage Sought

Firm	*Mine*	*Location*	*National Ranking*[1] *1942*	*1943*	*1949*	*Amount of Damage Suit*
Homestake Mining Co.	Homestake mine	Lead, South Dakota	1	2	1	$10,778,448
Alaska-Pacific Cons. Mining Company[2]	Lucky Shot	Willow Creek, Alaska	17	—	—	209,719
Idaho Maryland Mines Corporation[3]	Idaho Maryland, Brunswick	Grass Valley, California	10	—	4	5,021,799
Central Eureka Mining Company[4]	Eureka	Sutter Creek, California	—	—	17	1,256,694
Oro Fina Consolidated Mines, Inc.	Oro Fina	Auburn, California	—	—	—	72,584
Bald Mountain Mining Company[5]	Trojan	Trojan, South Dakota	22	—	—	167,754
Ace Dredging Company		Fresno, California	—	—	—	19,000
Alabama-California Gold Mines Co.[6]	Alabama	Penryn, California	—	—	—	220,000
Ashland Mines, Inc.		Merlin, Oregon	—	—	—	150,000
Consolidated Chollar Gould & Savage Mining Co.[7]	Overman	Virginia City, Nevada	—	—	—	175,000
Edgecumbe Exploration Co.		Sitka, Alaska	—	—	—	40,000
Ermont Mines, Inc.		Portland, Oregon	—	—	—	175,000
F. G. Gibson	Mad Ox mine	Shasta County, California	—	—	—	50,000
Golden Eagle Min. Co.		Ione, Nevada	—	—	—	50,000
Fred Lyman	Mining Rings	Congress, Wyoming	—	—	—	120,000
Paul Nardin	Nellie	Telluride, Colorado	—	—	—	20,000

[1] Mines with a national ranking all produced more than 17,000 ounces gold each year. [2] Second largest lode gold producer in Alaska in 1942. [3] Third largest California producer in 1942. [4] Tenth largest Cal. producer in 1942. [5] Second largest S. Dakota producer in 1942. [6] Thirteenth largest Cal. producer in 1942. [7] Seventh largest Nevada producer in 1942.

Columbia-Geneva STEEL AT WORK IN THE WEST—The San Francisco Bay Bridge, longest ... the wor...



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a two-compartment shaft from the surface. Stations were cut at the 300 and 400 levels, and development of these levels was carried on throughout the last six months of the year. All ore of shipping grade was sent to the *American Smelting and Refining Company's* El Paso smelter. E. D. Spaulding, mining engineer of Tucson, Arizona, is directing the work; R. E. Thurmond is mine superintendent.

A branch office of the *U.S. Atomic Energy Commission* is being opened in Phoenix, Arizona, Room 614, Goodrich Building. The office, a sub-office of the exploration branch, will be headed by A. J. Rambosek. Mr. Rambosek is assistant to H. E. Nelson, chief of the AEC office at Richfield, Utah, and one of the commission's engineers making preliminary tests of the uranium discoveries in Mohave County.

The last remnants of its ore body are being mined by the *United Verde Branch, Phelps Dodge Corporation,* Jerome, Arizona, and complete cessation of mining within the next couple of months is predicted by Louis S. Cates, chairman of the board. He reported that more than $1,000,000 had been spent looking for ore since the exhaustion of the main ore body. However, no major discoveries were made and the company finally began pulling the old pillars preparatory to a complete shut-down. The smelter at Clarkdale was closed in June of 1950, and since then clean-up mining and milling has been handled by a crew of about 150 men.

Development work is continuing at the *Williams* tungsten mine, sometimes called the *WO-3*, under lease to George B. Blonsky of Kingman, Arizona. The mine is located in the Aquairus Cliffs district, 72 miles southeast of Kingman. Old workings have been retimbered and repaired to give the mine about 3,600 feet of underground openings, and a camp has been built. A 50-ton mill is being erected at the mine site and should be ready for operation soon.

A crosscut is being driven from the 60-foot level in the shaft at the *Thundergod* mine, about 10 miles north of Apache Junction, Arizona. Equipment includes a 220 c.f.m. compressor and small gasoline hoist. L. G. Rosecrans of Mesa, Arizona, is owner and operator.

The *Copper Queen* mine, owned by the *Lawler Estate* and located near Bagdad, Arizona, has been optioned by the *Cyprus Mines Corporation* and exploration by crosscutting and diamond drilling is in progress. S. A. Spellmeyer of Bagdad is superintendent in charge for the Cyprus organization.

A crew of eight men is employed in exploration work on the 200-foot level of the *Ajax* mine, located in the Mineral Hill district of Pinal County, Arizona. The mine, owned by W. C. Smith of Coolidge is being operated by Ralph Pomeroy and associates, of Phoenix, Arizona. They propose about 400 feet of drifting to be followed by diamond drilling from the 200-foot level. While the principal metals in the Ajax are lead and zinc, some copper showings have been opened by current work on the 200 level.

D. P. Evans of Phoenix, Arizona, has leased the *Jumbo-Union Hill* claims nine miles northwest of Morristown. It is reported that about 80 cars of metallurgical grade fluorspar were shipped from the property by previous operators, mostly during World War II, and an ore shoot about 300 feet long has been mined to a depth of about 40 feet. The present operators, who have already shipped more than 100 tons of ore from development work, are sinking the shaft and expect to drift under the old stoped area at 100 feet. Leslie Taylor is mine superintendent.

The *American Minerals and Chemical Company* of Las Vegas, Nevada, is mining and shipping manganese ore from the *Fernando Bender* and the *Mowry* mines near Patagonia, Arizona, to the government's stockpile at Deming, New Mexico. I. Foster Smith at Patagonia is superintendent.

The Defense Materials Procurement Agency will pay $1,500 per short ton for crude No. 1 asbestos, $900 per ton for crude No. 2, and $400 per ton for crude No. 3 in its new program to purchase Arizona asbestos for defense and other essential uses. The program will run for three years or until a total of 1,500 tons of crude No. 1 and/or crude No. 1 and 2 have been bought. Shipments will be received at a warehouse in Globe, Arizona.

Bids were recently called for by the Sacramento office of the *Bureau of Indian Affairs* on a tungsten mining lease located on tribal land of the Morongo Indian Reservation in Riverside County, California. Dusan Milosovich and R. W. Harris were prospectors and discoverers of the tungsten deposit and preference was to be given to them if they submitted a valid bid for the lease. The *U.S. Geological Survey* examined the prospect and reported it as an open-cut 15 feet long, 6 to 8 feet wide, and 6 feet deep in a bed of garnetiferous rock. The scheelite or calcium tungstate "is disseminated throughout the bed or vein which trends in a northerly direction and dips about 60° to the west. Both walls of the vein are granite." Milosovich had about 8 tons of ore stored at the time of survey, which he claimed would assay 1.50 percent tungsten.

A milling plant to process the various materials located on *Conda* properties at Victorville, California reportedly has been completed at a cost of over $200,000 for buildings and equipment.

Production at the *Darwin* mine of *Anaconda Copper Mining Company* at Darwin, California, continues at a rate of approximately 300 tons of sulphide and 135 tons of oxide milling-grade ore daily. About 25 tons per day are shipped directly to the smelter.

Considerable amounts of high-grade managanese ore have been shipped to the government purchasing depot at Deming, New Mexico by *Lakeview Manganese Mines*, operating the *Lakeview* and other properties in the Crescent Mills area of California. About 10,000 tons of ore averaging about 45 percent manganese were mined from an area with a surface area of about one acre. Ore now produced is said to average 35 percent, and is concentrated before shipment. The company is currently developing an adjacent property.

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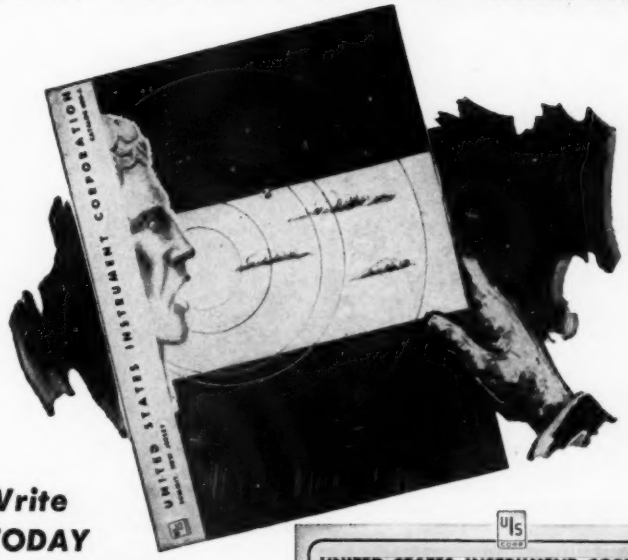

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NEVADA

Custom milling of tungsten ores has started at the new 100-ton mill erected by the *Trojan Mining and Milling Company* at Toy, Nevada, about 15 miles west of Lovelock. Equipment includes a heavy jaw crusher and crushing rolls, a ball mill, four gravity concentration tables, and a Denver jig. Three banks of six primary cells and two banks of clean-up cells will be used in the flotation section. Ore will come from the company's *Trojan* property in the Ragged Top Mountains, as well as from other mines in the vicinity.

Diamond drilling and exploration work are being conducted by the *Coranda Corporation* of San Jose, California, on several claims in the district between Thorne and Kinhead, Nevada, about seven miles from Hawthorne. The company is seeking to determine the extent of known andalusite deposits on the property, and is also seeking corundum of good quality. If results of the preliminary investigation are satisfactory, the company plans large-scale mining and eventual erection of a milling plant at the site to process the ores.

J. H. Baxter of Gabbs, Nevada, and Thomas Hancock of Lone Pine, California, have located a tungsten deposit in the Fairplay mining district of Nye County, Nevada. Assays show that some of the ore is as high grade as 15 percent WO_3. Shipments of ore said to assay from 4.50 to 8.33 percent have been made to the plant at Sodaville and to the *U.S. Vanadium Company's* plant at Bishop. A road has now been built to the property and a contract for mining and haulage has been let to Bill Bennet of Fallon.

Lead King Mines, Inc. reports discovery of a galena-bearing vein 40 inches wide at its *Lead King* mine 14 miles north of Las Vegas, Nevada. The company is currently crosscutting on the 250-foot level.

Drifting continues in an easterly direction toward the Halifax Fault at the *Summit King* mine being developed by the *Tonopah Development Company* north of Tonopah, Nevada. Good milling grade values in gold and silver continue to hold, and sinking on the orebody is expected to start soon. Long-range plans call for construction of a three-compartment shaft and a mill.

The *Mineral Materials Company* has temporarily stopped its shipments of iron ore from its operations at Lovelock, Nevada, and has partially suspended mining operations for the winter. Some equipment has been transferred to a new iron ore development being undertaken by the company near Baker, California. To date, 5,636 carloads of iron ore have been shipped from Lovelock. Tonnage was 280,642 of which all but 3,799 were long tons. Two of the four power shovels, trucks, and other equipment were moved to the California operation. Wagon drills were left at Lovelock to continue exploratory drilling and development work.

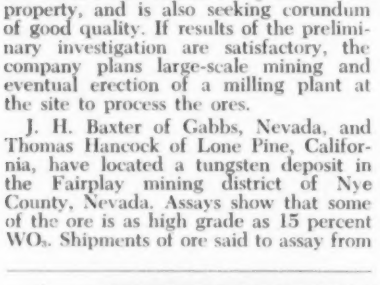
A $400,000 expansion of its magnesite facilities at Gabbs, Nevada is planned by *Basic Refractories, Inc.* Improvements include conversion of the present preparation, feed, and blending system from wet processes to dry, and the installation of efficient dust collecting equipment.

The *California Tungsten Corporation* of Salt Lake City, Utah has taken over the *Linka* tungsten property in Smokey Valley, Nevada. Samples are being taken in the mine and a diamond drilling project is planned if the sampling is good. President of the firm is E. G. Frawley; J. L. Stansbury is field representative on the property.

Titanium Metals Corporation of America expects to reach a production goal of four tons of titanium per day this month. Demand for the metal is increasing and the company hopes to double its present operations in the near future. Shipments are made to manufacturers in 1,500-pound ingots.

The *George Green Mining Company* of Willets, California is reported to have secured a 10-year royalty basis lease on an iron mine 29 miles south of Gabbs Valley, Nevada. Shipments by truck of 500 tons per day are planned. Open pit mining will be conducted, since there is a large tonnage at the surface. The lease was obtained from Harry Howard, George H. Douglas, Claude W. Douglas, and Audry Barrow.

Black Rock Mining Corporation's mill at the *Lincoln* mine near Hiko, Nevada, is handling 500 tons of scheelite mill feed daily. It had formerly treated 750 tons daily at the *Northumberland* gold mine north of Tonopah, but was moved to the Lincoln county operation when steady mine production got under way. Ore averages 4.0 percent zinc, and also carries molybdenum and fluorspar. The zinc and molybdenum are by-products recovered when the tungsten is milled, but the fluorspar is too impure for use.



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NEW MEXICO

The *American Potash & Chemical Corporation* of Los Angeles has started exploratory core drilling on land lying almost 50 miles east of Carlsbad in Eddy County, New Mexico. According to T. Edson, assistant vice president of the firm, this is the first interest that American Potash has shown in the Carlsbad area. The company has a plant at Trona, California, where potash and other chemicals are extracted from the brine of Searles Lake, and also a Los Angeles firm which produces chemical products. Drilling for American potash will be done by the *Joy Manufacturing Company*.

U.S. Atomic Energy Commission representatives and major mining interests are investigating a discovery of uranium deposits in Sierra County, New Mexico. Traces of rare earth elements of tantalite and columbite were found in the same area. Full extent of the deposits cannot be determined yet because the depth of the ore vein has not been found, but outcroppings have been traced reportedly for 18 miles.

Private concerns will build at least two new uranium mills in the Colorado Plateau area within the next two years. One of the mills will be built at Shiprock, New Mexico, and another at Hite, Utah. The two mills will be started in 1953, according to Jesse C. Johnson, director of the AEC's raw materials division. Each of them will cost between $1,000,000 and $3,000,000. Two other plants are under consideration for which sites have not been selected.

The *Pumice Corporation of America* has been sold by its holding company *Whittaker, Clark & Daniels, Inc.* of New York City, to the *U.S. Gypsum Corporation* which recently purchased large holdings of perlite deposits in an adjacent area. The change-over from pumice operations to perlite production will be made with no expected change in personnel. The Pumice project has been in operation since 1936, at which time a crushing and sizing plant was erected and operated by the *Barnsdall Oil Company* of Oklahoma City, Oklahoma. The mine is an open pit located 8 miles north of Grants, New Mexico. In 1941, the Barnsdall interests were purchased by Whittaker and the Pumice Corporation of America was formed.

The *U.S. Atomic Energy Commission* has segregated about 15,000 acres of public domain in McKinley and Valencia Counties of New Mexico for use in their uranium exploration program. The segregation is a continuation of the AEC effort to develop sufficient uranium ores to keep production on the Colorado Plateau at a high level. More than two thirds of the land withdrawn is in McKinley County.

John A. Graves of Aztec, New Mexico has applied for a prospecting permit with exclusive rights to lease about 7,600 acres of the 380,000-acre tribal lands of the Zuni Indians in the Grants Uranium District. The Zuni tribal council is considering the request. Any lease subsequently granted would provide a guaranteed annual rental and royalties.

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Polaris and Coeur d'Alene Agree on Exploration

Polaris Mining Company, in a new expansion move in Shoshone County, Idaho's silver belt, will drive a two-mile exploration cross cut at below sea level depth through properties lying between its Silver Summit mine and the Galena mine of Vulcan Silver-Lead Corporation, being developed by American Smelting and Refining Company.

The bore will start from an exploration drift driven into Merger Mines Corporation's ground several years ago from the Silver Summit mine's 3,000-foot level. It will skirt the boundary between American Silver Mining Company and Silver Standard Mining Company properties, and go well into the property of Rainbow Mining & Milling Company, which is 51 percent owned by Coeur d'Alene Mines Corporation. Silver Summit and Coeur d'Alene Mines' workings will be connected by a 460-foot raise to CDA Mines' 2800 level drift on American Silver's "wire silver" vein.

Following completion of the long bore, Polaris plans to undertake other work on properties of American Silver, Silver Standard, Rainbow, and CDA Mines. Changes will have to be made in existing working agreements that CDA Mines has with American Silver, Silver Standard, Coeur d'Alene Consolidated Silver-Lead Mining Company, and Callihan Consolidated Mining Company before the agreement becomes effective.

Northwest Power Restored To Metal Producers

Northwest metal producers who were forced to curtail production last November because of a government-ordered 10 percent cut in electric power have restored their former production schedules.

Among the metal firms, Bunker Hill & Sullivan Mining and Concentrating Company benefitted most from the lifting of the Defense Electric Power Administration's order in January following unseasonal rains and mild temperatures.

The big operation at Kellogg, Idaho, had cut its mine-mill output 30 percent in order to make a 10 percent power saving because of heavy, fixed underground power requirements. Among work suspended and now underway again is a block-caving project which furnishes about 1,500 tons of mill feed daily. The Bunker Hill mill is currently treating about 3,000 tons of ore daily. The Bunker Hill lead smelter was virtually unaffected by the cut in firm power. Production at the Sullivan electrolytic zinc plant, however, dropped to less than 75 percent of capacity, and is now back in full operation.

Kaiser Aluminum and Chemical Corporation rushed seven of its eight potlines back into operation at the corporation's Mead reduction plant at Spokane, Washington when interruptible power was restored. The Northwest's drought-induced power shortage had cut the plant's output of primary aluminum pig to 12,500,000 pounds per month. Plant capacity is 27,000,000 pounds monthly.

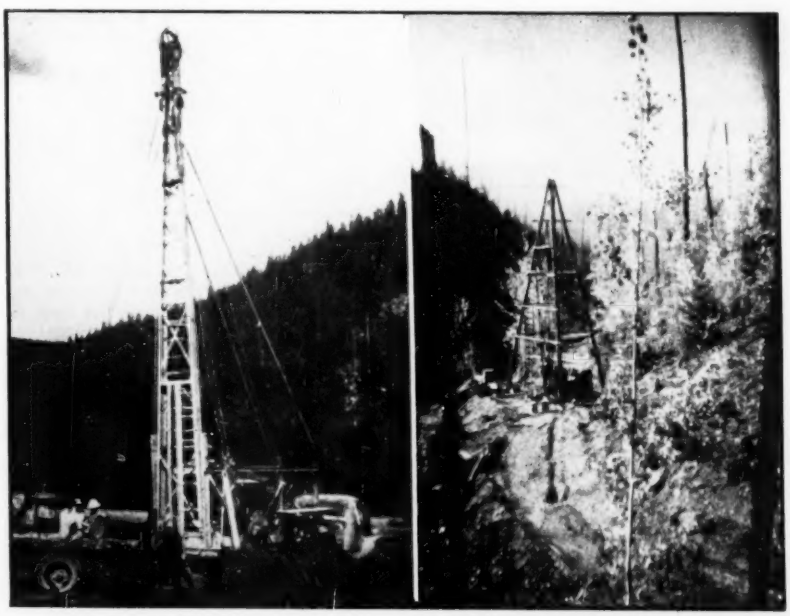
Pacific Northwest Alloys Company resumed production of ferrosilicon at the government-owned Mead plant. The four furnaces used for this purpose and about three-quarters of the electric vacuum furnaces used to produce magnesium had been shut down. Magnesium operations have been increased to about 50 percent of capacity.

Sunshine Mining Company has resumed driving of an exploration crosscut from its 3,700 level to open the Silver Syndicate fault-vein midway between present East and West Rambo stoping areas. Work was suspended last November because of the Northwest power shortage. Production from Silver Syndicate has been stepped up to about 4,000 tons monthly. Norman M. Smith is directing engineer for *Silver Syndicate, Inc.* The property is in the Coeur d'Alene mining region. Sunshine has established the first permanent scholarship endowment fund exclusively for the School of Mines at the University of Idaho. The $5,000 fund is a memorial to the late A. E. Larson, former president of the firm.

In the nearby *Sunshine Consolidated* mine, also being developed by Sunshine, drifting has been resumed westerly on the Yankee Girl vein at the 2,700 level. The work is expected to open oreshoots found below on the main 3,100 development level. More than 1,000 tons of silver-copper ore are being mined monthly from 3,100 level stopes. Norman M. Smith is resident engineer.

American Smelting and Refining Company and *Federal Mining & Smelting Company*, a 55 percent owned subsidiary of AS&R, will merge through an exchange of stock if stockholders approve the action at a meeting in April. Federal operates the *Morning*, the *Frisco*, and the *Page* mines in Idaho, as well as property in the Tri-State district.

Uranium-bearing pitchblende similar to that found in the *Sunshine* mine in 1949 has been found in the adjoining old *Crescent* mine, being reopened by *Bunker Hill & Sullivan Mining and Con-*



PACNOR PROSPECTS METALINE DISTRICT

Pacnor Mines, Inc. has carried out an intensive prospecting-exploration program in the Metaline Falls district of Washington. The Spokane firm, headed by Karl W. Jasper, has done surface prospecting, geologic mapping, and diamond and churn drilling. Pictured above at left is a churn drill at work on Pacnor ground near the Grandview mine at Metaline Falls operated by American Zinc, Lead and Smelting Company. Churn drilling is in progress through overburden to get to bedrock so that diamond drilling can be started. At right is a Pacnor diamond drill at work on the 47-claim Russian River group. This hole was drilled to a depth of 600 feet to test for mineralization in the Metaline limestone.

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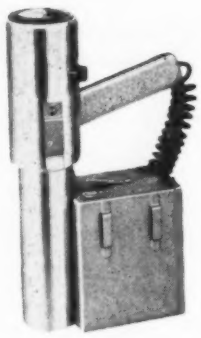

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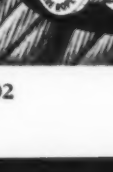

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centrating Company. The Sunshine showings, on the 3,100 and 3,700 levels, were too spotty to be commercial. The Crescent showing, in the creek level adit, has not been opened sufficiently to determine if it is commercial. J. B. Haffner is general manager of Bunker Hill & Sullivan.

The *Graney Mining Company* has been incorporated in Boise, Idaho with a capitalization of $150,000. Incorporators are Thomas Graney of Lakeview; Hugh C. Lannen of Pinehurst; and W. F. McNaughton and H. S. Sanderson, both of Coeur d'Alene.

The ventilation system at the big *Bunker Hill* mine at Kellogg, Idaho has been revamped to increase circulation from 70,000 cubic feet a minute to 135,000. An additional air intake was provided through a new raise to the surface and additional fans installed underground. Temperatures have been lowered substantially in bottom levels. J. B. Haffner of Kellogg, is general manager of *Bunker Hill & Sullivan Mining and Concentrating Company.*

Kootenai Dike Mines, Inc. is planning a diamond drilling program this spring at its *Idamont* property in Boundary County, Idaho. The purpose will be to test the extent of known vein structures. Dr. Ray E. Currie of San Francisco is president.

Polaris Mining Company has resumed driving of the Good Hope lateral from the 3,000-foot level of the *Silver Summit* mine in the silver belt of the Coeur d'Alenes, Idaho. The bore will continue parallel to the Chester vein through 500 feet of *Silver Dollar Mining Company's* extralateral rights area and on through *Chester Mining Company* ground. Polaris' exploration tunnel into the *Purim* area from the Silver Summit 3,000 level was more than 200 feet inside the Purim boundary at last report and progressing on a two-shift basis.

The *Conjecture* mine's ore body in the Lakeview area of the Pend Oreille mining district in Idaho's panhandle has widened from 6 feet on the old 200 (bottom level) to 16 feet on the new 400 level. Values are in lead, zinc, silver, and tungsten. Development ore is being stockpiled. Work of unwatering, rehabilitating, and deepening the early-day producer was started in 1951 by new owners Donald Majer and Gerald M. Fennell, Spokane business men.

Calera Mining Company has had to curtail its production of cobalt concentrates at the *Blackbird* mine, Lemhi County, Idaho because of a lack of refinery facilities. Stockpiles are reported adequate to keep the new Garfield, Utah, cobalt refinery supplied until it gets into full operation. About 40 percent of the normal 250-man crew have been laid off.

Triumph Mining Company resumed production at its mine near Hailey, Idaho, after making progress in pumping flood waters which invaded the mine. At last report, the inflow was only about one-sixth the initial estimate of 3,000 gallons a minute which drove workers from the three lowest levels. First production was resumed from above the 700-foot level. C. C. Livingston is acting superintendent.

A 2½-foot width of excellent milling grade lead-silver ore in the *Lucky Friday Silver-Lead Mines'* property near Mullan, Idaho, widened to 16 feet in drifting northwesterly from the 2,000 level station. Current mine output is about 100 tons of ore daily. A new 1,500-cubic-foot, $25,000 air compressor has been ordered.

A three-compartment raise has been started from the 2,000 level to the tunnel level to provide new operating shaft. The raise is now up about feet above the 2,000-foot level and will be continued up to the 1,800-foot level before sinking from the 2,000 to the 2,200 level will be started. This will eventually provide a three-compartment off-set winze from the 2,000 level to the adit tunnel level.

A snowslide ripped out 75 feet of the *Snoose Mining Company's* snowshed south of Hailey, Idaho in January. The slide went through the gallows frame and partially filled the shaft with snow. An employee was surrounded by seven feet of snow but emerged unhurt. A concrete retaining wall protected the other mine buildings. The bulk of the slide was removed the following day by slushing the snow down the shaft (thereby melting it) and pumping it out by mine pumps.

Idaho Birthday Mines Company, operating near Lownan, Idaho, has been awarded a contract to Joseph Brandel for the driving of 450 feet of additional tunnel to explore for a vein encountered in recent diamond drilling. The company started to drive a low-level development and drainage tunnel in July 1951 which was driven to its heading of 2,208 feet by November 1952. A hole was then drilled 402 feet beyond the face of the tunnel. Although water pressure forced abandonment of the hole, lighter vein material washed out of the hole carried gold values. Charles S. Woodward is president of Idaho Birthday.

New Era Mines is planning a northerly crosscut from the 1,200 level of the *Sunset Minerals* shaft. The property lies between New Era and *Lookout Mountain Mining and Milling Company* holdings in the Coeur d'Alene mining region of Idaho. The crosscut would cut about 3,000 feet and penetrate the heart of New Era's large holdings.

Idaho Custer Mines, Inc., which temporarily suspended mining operations at the *Livingston* mine in Custer county last fall, plans to resume work in the spring. Paul Grosenick of Seattle is president.

Ore running 14 percent combined lead-zinc is being stoped and milled by *Nabob Silver-Lead Company*, operating in the Pine Creek district of the Coeur d'Alene mining region, Idaho. A ventilation raise is being driven to hole through to upper workings.

Another Pine Creek district producer *Mascot Mines Inc.*, also is milling an improved grade of lead-zinc ore. The mill is being operated two shifts daily. Twelve men are working underground.

Lookout Mountain Mining and Milling Company, also in the Pine Creek district of Idaho, has driven more than 400 feet of an exploration crosscut to develop its vein system from the 1200 level of the *Sunset Minerals, Inc.'s* shaft.

The new zinc-lead-silver concentrator of Gibbonsville Mining and Exploration Company, two miles west of Kellogg, Idaho, will start treating Coeur d'Alene river mill tailings as soon as the ground thaws in the spring. Mill machinery was successfully tested before the winter freeze, according to Wellman Clark, vice president.

Nighthawk Silver-Lead Mining Company has cleaned out an old tunnel to a winze at its Kootenai County mine at

the north end of Hayden Lake in Idaho, and verified location of a silver-lead vein structure. Last work was in 1918. B. O. Bezer is president.

Silver Star-Queens Mines, Inc. of Bellevue, Idaho, has started a raising program to connect with old upper workings in the *Queen* and *Minnie Moore* mines. This work will determine whether ore exposed in 1952 from the 450-foot level of the Rockwell shaft is a separate body or the downward extension of shoots that yielded a large amount of high-grade lead-silver-zinc ore on upper levels in early days, according to Nat T. Davis, Salt Lake Valley smelters. A winze is being sunk on the ore and production also is from stopes.

MONTANA

Anaconda Copper Mining Company has purchased mineral properties and equipment of *North Butte Mining Company*, including the *Granite Mountain*, *Speculator*, *Tuolumne*, and *Gem* mines. North Butte, organized in 1905, operated continuously until 1923 and intermittently since. Chester H. Steele is vice president in charge of Anaconda's western operations.

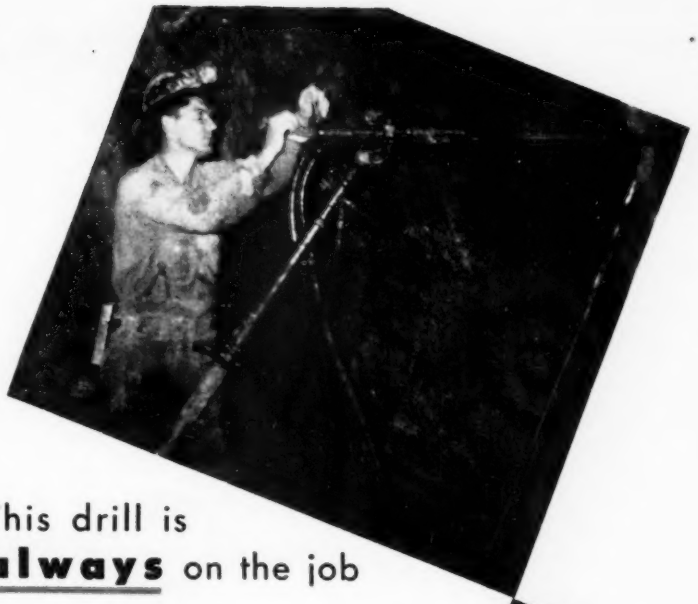
Swansea Mines, Inc. is nearing its objective at the *Silver Bell* property in Lewis and Clark County, Montana. Miners are drifting along a vein in a new lower tunnel to get under a surface ore showing. Consideration then will be given to deeper development at the *Carbonate* mine, from which the firm produced ore in 1942 and 1943. C. L. Hewitt of Helena, is president.

The *Pearl* property in the Winston district of Broadwater County, Montana, will be explored for lead, zinc, and copper under a $12,000, 50 percent government participation project. The DMEA agreement is with Edmund E. Pohl of Seattle and H. G. and A. R. Kleinschmidt of Helena.

The *Garibaldi* claims in the western part of the Butte district, Montana, near the *Minnie Jane* mine, will be explored for manganese under a $7,000 DMEA contract with Irving G. Irving and Robert H. Nelson of Butte. The work will be done by churn drilling.

Ed Lahey, Butte's flying prospector, has mined 35,000 tons of low-grade ore from the surface of the *Alta* property near Corbin, south of Helena, Montana, since 1950. He located the mineralized zone by studying aerial photos which he took in prospecting the long dormant mine from the air. Lahey, 54, has been mining most of his life and has been flying for 27 years. He has covered 100,000 miles by air.

Western Mines Company will undertake bulldozer trenching and then diamond drilling at its tungsten property in Powell County, Montana. The firm recently received a $16,200 DMEA loan for the project. Pat T. Phalen of Spokane, Washington, will act as general manager, and John B. Hopkins of Grand Junction, Colorado, will serve as consulting geologist.



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Elmer L. and Jessie M. Allen of Midvale, Utah plan to rehabilitate an old tunnel that extends into the mountain about 400 feet at their property in the Sepey Creek mining district of Sanders County, Montana. They recently received a $10,800 DMEA contract to explore for copper. They also plan to extend the tunnel to crosscut a fissure running from north to south and to follow the fissure about 300 feet under old workings where considerable copper ore was taken out in earlier days.

The government's manganese purchasing depot at Butte, Montana will now accept manganese oxide, so-called "black ore," as well as manganese carbonate or "pink ore." Under revised regulations, any producer authorized to ship carbonate ores to the Butte depot may now ship oxides as well. Shipments of oxides aggregating less than 200 tons in a 30-day period will be purchased at Butte at a flat rate ranging from $4.87 per long dry ton for 18 percent ore to $51.62 per ton for 39 percent ore. Where shipments total more than 200 tons in that period, a preliminary payment will be made on the same price basis, but final settlement will depend on tests to determine the amount of manganese that can be recovered from the ore. The decision to change the regulations was based on investigations which showed that there was much manganese oxide ore within easy shipping distance of Butte which could be handled by existing milling facilities at the depot.

Ted E. Collins of Helena, trustee for stockholders and creditors of *Marysville Gold Mining Company*, has court authorization to sell assets of the company to Lester R. Taylor, T. K. Haas, and Guy L. Maberry for $150,000. The sum is payable December 31, 1962, and a royalty of 10 percent of net smelter returns will apply on payments. The property, in the Ottawa mining district of Lewis and Clark County, Montana, is said to have yielded about $40,000 worth of gold-silver ore.

The *Oro* mine, 11 miles northwest of Troy in northwestern Montana's Yaak River district, has been taken over under lease and option by Al Osborn of Kellogg, Idaho. The property was located five years ago by Norman and Roland Obermayer. Osborn and a helper have driven three tunnels near the surface and disclosed lead-silver ore in all three. After additional work to block out ore, he plans to install a small crushing and jigging plant to make a gravity separation.

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OREGON

The *National Metallurgical Corporation* has been formed by the *Apex Smelting Company* of Chicago and the *American Smelting and Refining Company*. The new plant will take over operation of the new plant now being built by Apex at Springfield, Oregon for the production of aluminum silicon metal from clays. Completion of the plant is expected by June. Officers of the new firm will be William A. Singer, president; R. D. Taylor, vice president; R. K. Beck, vice president; L. Lippa, secretary and treasurer.

Udell and Watkins of Corvallis, Oregon have purchased the stock of two old mining companies in Oregon and plan to reactivate the mines this spring. *Calapooia & Blue River Mill & Mining Company*, formed in 1890 to develop the *Poorman* mine, will reopen the Poorman. Values consist of gold in manganese, with considerable lead and zinc indicated on the lower levels. The *Merger Mining Company*, operating the *Merger* mine not far from the Poorman, will be reopened as a gold mine.

The mountain wilderness making up western Josephine and eastern Curry counties may prove to be one of Oregon's most highly mineralized regions, the U. S. Bureau of Mines said in reporting on initial results of a 1952 reconnaissance survey. In cooperation with *California-Oregon Power Company*, the Bureau's Northwest Mining Division carried out a general investigation of mineral deposits in southwestern Oregon. The work included trenching and sampling of a nickel deposit on Woodcock Mountain in Josephine County.

Oregon's gold production is believed to have hit an all-time low in 1952. Production is estimated at about $188,000 by the Oregon State Department of Geology and Mineral Industries. In 1940, the output was valued at $4,000,000. Placer mining accounted for more than 90 percent of the 1952 gold output. Nearly all of this came from operations of *Powder River Dredging Company* in Sumpter Valley, Baker County. The department's report says that high costs, fixed price of gold, and government gold regulations all serve to discourage gold mining.

WASHINGTON

An instrument called a "radar geoscope" was used by *Columbian Lead and Zinc Mining Company* of Spokane in surface exploration the past season at its 500-acre property in the Metaline district of Pend Oreille County, Washington. The device reportedly indicated two structures, each several thousand feet long. Included in $26,000 worth of diamond drilling planned this year will be downholes to test the structures. Robert F. Wallis of Spokane is president.

Milling ore carrying values in copper, zinc, lead, cadmium, and tungsten has been encountered by drift work at the *Talisman* mine at Laurier, in the Orient mining district, Washington. Spokane *Mining Syndicate* is developing the property with DMEA aid. Henry T. Born is company president and Walter A. Richelsen, mining engineer and geologist in charge of operations.

Northwest Magnesite Company recently replaced 17 miles of one-inch traction cable on its Keystone-Red Marble quarry tramway near Chewelah, Stevens County, Washington, in only 50 hours. Special machines, designed and built in company shops, wound old cable onto reels as the new cable was fed into place. Gasoline powered engines were used to move the cable. Electric motors rewound the old cable. Tram buckets followed their regular cycle, stopping only long enough for readjustment to the new cable. Former practice had been to remove all the ore buckets when changing cables. Howard Ziebell is company manager, and Charles Kuchera is tram superintendent.

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Refinery, Mill Planned By Minerals Engineering

Minerals Engineering Company of Grand Junction, Colorado will build a $225,000 tungsten ore concentrating mill near Glen, Montana and a $700,000 refining plant at Salt Lake City, Utah. The mill, scheduled for completion in the latter part of 1953, will be financed by sale of $296,250 worth of stock. A loan will be sought from the Reconstruction Finance Corporation to finance the refinery, which will begin operation August 1 if negotiations are completed on schedule.

The company has acquired a 12-acre tract near the Surplus Canal and Jordan River in Utah from the Eimco Corporation for a plant site. The refinery will treat low-grade tungsten concentrates produced at the new mill, and custom ore will be bought from other mines and plants within reasonable shipping distance. Arrangements are also being made by the Grand Junction firm to operate the adjoining Montana properties of American Alloy Metals, Inc.

First project for the refinery is processing 29,000 tons of residue acquired by Eimco when it purchased the now-defunct tungsten refinery of Metals Reserve Company following World War II. Market for the "synthetic scheelite" produced at the new refinery is guaranteed under the terms of the United States purchase program.

Two Major Utah Firms Studying Merger Plan

Silver King Coalition Mines Company and Park-Utah Consolidated Mines Company will merge all assets, form a new company, and reopen their closed-down properties if tentative agreements now in the hands of company lawyers receive approval of the two boards of directors.

The two Park City, Utah firms stopped production last fall when lead-zinc prices dropped appreciably and now are considering the merger because of the "greater efficiency in exploration, production, drainage, and similar matters." In addition, large areas of adjacent, unexplored ground are held by both companies.

The consolidated firm would own an estimated 8,700 acres of contiguous, patented claims, an 800-ton-per-day mill (Silver King), and the stock interest which Park Utah has in a number of other firms in the district. Park Utah has paid out more than $34,035,237 in dividends since it was organized, and Silver King dividend payments top the $35,000,000 mark.

Present Silver King stockholders will receive 1.25 shares in the new company for each share now held, and Park Utah stockholders will get 1.1 shares. The new corporation, for which no name has yet been chosen, will be capitalized for 6,000,000 shares of $1 par value. All unissued stock would be held in the treasury for future purposes. Silver King would hold approximately 40 percent of the new company's stock and Park Utah 60 percent.

American Smelting and Refining Company owns roughly 24.85 percent of Silver King and Anaconda Copper Mining Company owns about 22.86 percent of Park-Utah Consolidated. Both companies are long-time producers of lead, zinc, copper, gold and silver.

AEC Releases Details On Sampling Report

Details have been released by the U. S. Atomic Energy Commission on the sharply critical report drawn up by the Colorado School of Mines Research Foundation on Colorado Plateau uranium sampling procedures. (See Mining World, February 1953, p. 87.) Use of unsatisfactory equipment was the major criticism, with the investigating team particularly objecting to use of Jones splitters, bucket elevators, "coffee mills," lack of temperature controls in testing moisture samples, and use of final samples in moisture determination. (The Jones splitter is used at all but one plant, and bucket elevators are also widely used.)

Specific evaluations of the plants involved included: *Thompson, Utah plant of United States Vanadium Company*—Crushing is inadequate in that it is too coarse in size. Criticized use of Jones splitter and bucket elevator and recommended addition of third stage of crushing and sampling. *Uravan, Colorado plant of United States Vanadium Company*—Criticized use of Jones splitter, bucket elevator, and Engelbrach "coffee mill," but added that corrective measures are already underway. *Hite, Utah plant of Vanadium Corporation of America*—Procedures employed at plant inadequate throughout and extensive changes necessary if to continue serving as qualified mill. *Durango, Colorado plant of Vanadium Corporation of America*—Criticized use of Jones splitters, use of final sample for moisture determination. *Monticello, Utah plant of American Smelting and Refining Company*—No deficiencies or inadequacies noted. *Shiprock, New Mexico plant of American Smelting and Refining Company*—Use of Jones splitters again condemned. *Grand Junction, Colorado plant of Vanadium Corporation of America*—Inadequacies in crushing and sampling changes. *Grand Junction, Colorado plant of Climax Uranium Company*—Use of bucket elevators, etc.

UTEX DEVELOPING URANIUM PROPERTY

Shown above are the ore bin and headframe under construction at the Utex Exploration Company's uranium properties in the Big Indian area, San Juan County, Utah. Charles A. Steen, Utex's 33-year-old chief geologist, is responsible for discovering a pitchblende-bearing vein, from which one 114-ton shipment at $100 per ton has been made to Thompson, Utah purchasing depot of U. S. Vanadium Company. Diamond drilling 1,000 feet from the shaft revealed a second mineralized area, but it is not known whether this is a new orebody or part of the old one. Mr. Steen, who has controlling interest in Utex, and four associates have staked 12 claims in the area, and will undertake a drilling program in the near future to determine the extent and value of the entire deposit. Operations are on a two-shift basis, and a second shipment of ore will be made soon. Other company officers are Dan O'Laurie, president, and W. T. Hudson, vice president. Utex headquarters are in Moab, Utah.

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COLORADO

Colorado Plateau uranium producers have won another round in their fight to stake valid uranium claims on public lands withdrawn by gas and oil interests or other government agencies. Colorado state senator Stephen L. R. McNichols, attorney for the *Uranium Ore Producers Association*, announced that the Bureau of Land Management has approved a plan to include a clause in the new AEC contracts guaranteeing the miners' right to contest the claims titles. McNichols also conferred with officials from the Department of the Interior in Washington, but no information is yet available on that meeting. The AEC has already approved inclusion of the clause.

The American Smelting and Refining Company has completed negotiations to buy electric power for its *Keystone* lead-zinc operations near Crested Butte, Colorado from the Gunnison County Rural Electrification Association. The REA must install $113,700 worth of facilities and Keystone will furnish $50,000 when construction is begun on the new line from Gunnison to Crested Butte. A 750-kva maximum load is anticipated. When the planned 200-ton-per-day Keystone mill is operating, the REA is guaranteed a minimum payment of $2,000 per month, which will be reduced to $850 per month when the mill is idle. ASARCO officials have indicated that the mill will need electric power in the fall, and the REA expects to receive its initial power from the Bureau of Reclamation in April.

U. S. Oil and Mines Company has reportedly purchased a 120-ton-per-day differential flotation mill from the *Great Eastern Mining Company* at Howardsville, San Juan County, Colorado. U. S. Oil is operating the *Lark* lead-zinc mine on Cement Creek seven miles from Silverton, and is hauling Lark dump ore to the mill. This mill was built by the *Denver Equipment Company* before World War II and is known locally as the Pride mill. Other dump ore being treated at the mill was trucked from the *Columbus* mine at Animas Forks.

Fire has destroyed part of a tungsten mill leased by the *Vanadium Corporation of America* at Nederland, Colorado recently, causing an estimated $20,000 damage. D. C. Harrison, superintendent, said the blaze apparently was started by an oil heater. The building is owned by *Hetzer Mines, Inc.*

The American Smelting and Refining Company is continuing its exploration program on Fryer Hill in the Leadville mining district, Lake County, Colorado. Work centers around the leased Robert Emmett shaft and the area adjacent to the Leadville drainage tunnel. A raise from the Downtown lateral of the tunnel has been completed to the old workings of the *Ponsardine* mine. A separate exploration project is underway from the Downtown lateral, where drifting and raising has cut old workings believed to be part of the *Blonger* mine.

The Idarado Mining Company has continued development and stoping through the winter at its Meldrum tunnel operation above Pandora, in San Miguel County, Colorado. Snowslides crossing the mine road above Pandora forced stoppage of normal operations for short periods, but trucking of ore to the custom milling unit of *Telluride Mines, Inc.* at Pandora continued after the road was plowed out. The ore treated by Telluride Mines is mill-grade zinc-lead-silver-gold-copper ore mined from the Ajax vein. Idarado has been developing the Ajax and Black Bear veins through the Meldrum, and has continued its large operations on the Black Bear vein, which is reached through the Treasury tunnel portalling in Ouray County on the opposite side of the San Juan Mountains. William Nelson of Telluride is in charge of Meldrum operations.

The Climax flotation plant of the *Climax Molybdenum Company* treated an average of 14,500 tons of ore per day during 1952. The No. 3 mill was completed in December 1952, and has a capacity of 5,000 tons per day. Plans are being readied and initial contracts let for an additional milling unit scheduled to bring total capacity to 25,000 tons of molybdenum ore per day by January 1, 1954. The Climax plant is located in Climax, Lake County, Colorado.

UTAH

The United States Smelting, Refining and Mining Company has established a new industrial development department at its Salt Lake City, Utah headquarters to adapt new methods of mining and processing ores to company operations, and to work out more efficient application of present operating methods. The de-

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1	75	Al.Ch.	900	250	2300
1	75	Whse.	900	75	2300
1	25	Ideal	1750	125	220
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1	800	G.E.	MT	2200	440
1	700	Whse.	CW	2300	720
1	600	G.E.	MT 20	2300	360
1	500	Al.Ch.	ANY	2200	514
2	500	G.E.	I-16-M	2300	450
1	400	G.E.	MT 412	2200	440
1	250	Whse.	CW 937	440	1200
1	250	Al.Ch.	ANY	440	720
1	250	G.E.	MT 414	2200	300
1	125	Whse.	CW 870	2200	900
1	100	Whse.	CW 766	440	1200
1	100	F.M.	H 20 C	440	900
2	100	G.E.	I-15A-M	2300	514

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QU.	HP	MAKE	P.F.	VOLTS	RPM
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1	3000	Whse.	80	4800/2400	720
2	2100	G.E.	100	2300	360
2	1750	G.E.	100	2300	3600
1	750	G.E.	80	2300	450
1	700	G.E.	80	2300	720
1	250	G.E.	100	2300	514
1	200	Whse.	80	440	1200
1	187	G.E.	80	440	720
1	500	G.E.	80	2300	450
1	150	G.E.	100	2200	900
1	150	G.E.	100	550	600
1	120	G.E.	80	550	450
2	135	G.E.	80	4000/2200	1200
3	125	El. Mchy.	100	4800/2400	900
1	125	G.E.	80	2200	900
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3	100	G.E.	H	1	33,000-2300
3	25	G.E.	H	1	2400-120/240
40 (new)	3	Al.Ch.	01SC	1	2400-120/240

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1—8" Allen-Sherman-Hoff Hydroseal Pump with 40 HP AC motor

1—#197 Massco Auto. Density Controller

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partment will also att[e]pt to incr[e]se production and the va[r]ty of prod[u]cts manufactured by study[i]ng proposed [n]ew operations or plants. J. [E]. Ehrhorn, former assistant to the ma[n]ager of [w]estern mines, will head the d[e]partment.

The U. S. Atomic Ene[r]gy Commission has withdrawn from cl[a]im location [o]n equivalent of about 40 [s]ections of [l]and in Montrose County, C[o]lorado and San Juan and Emery Counti[e]s, Utah. It has also accelerated its aerial [e]xploration program in Garfield County, Utah, and [h]as flown in fifteen AEC and U. S. Geological Survey families to Escalante. Se[v]eral parties and helicopters equipped with radioactive mineral detectors will prospect and map the area. AEC western exploration offices are now located at 222 So[u]th West Temple, Salt Lake City.

W. S. Bryce, road superintendent, [r]eports that an access road which will [o]pen up a uranium mining area in Utah's Blanding-White Canyon district is [n]earing completion. The road cuts through Blue Clay Pass, into Hidden Valley [a]nd continues down to Red Canyon, where it connects with another access road [b]uilt under Mr. Bryce's supervision. Claims in this San Juan County are held by [J.] Plosser, *Vanadium Corporation of America*, and the *Delaney Mining Company*.

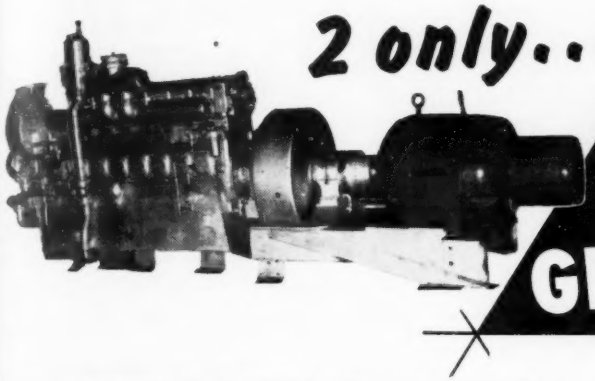
Lane Bertelson is sinking a new [v]ertical shaft at his *Sunnyside* uranium [m]ine in Utah's Marysvale district. The shaft will speed development of claims adjacent to both the *Vanadium Corporation of America* and *Bullion Monarch Mining Company* mines.

WYOMING

Kilns of the *Phosphate Mines, Inc.* at Susie, Wyoming are treating rock phosphate from a deposit at Leefe (north of Kemmerer) and trona from the Westvaco deposits near Green River. The plant opened in mid-December.

Two new locations in Wyoming have been announced for posting of maps showing surface areas of unusual radioactivity. These maps, designed to assist in the search for uranium-bearing ore bodies, will be released on the 15th of each month at the U.S. Geological Survey office, 305 Federal Building, Casper, Wyoming, and at the U. S. Geological Survey office, 1214 Bighorn Avenue, Wheatland, Wyoming. Other posting localities are: New York, New York; Denver, Colorado; Hot Springs, South Dakota; Rapid City, South Dakota; Grand Junction, Colorado; Grants, New Mexico; Salt Lake City, Utah; Richfield, Utah; and Butte, Montana.

A new geologic map of Wyoming, prepared by the Geological Survey of Wyoming and the University of Wyoming geology department, has been published. The map, which is uncolored, shows county roads, state and federal highways, the land grid, drainage, and settlements. Only a very small proportion of the 1927 state geologic map has been used—10,000 square miles out of a total of 97,000 square miles—and many of the 200 maps used came from unpublished sources. Copies are available at $1.25 each at the Distribution Section, U.S. Geological Survey, Denver Federal Center, Denver, Colorado.



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1—10 T JEFFREY 250 V. MH-2110 48-36" Ga.
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2—10 T GOODMAN 250 V. 36-B 36" Ga.
1—10 T WEST. 250 V. ML-907-C 36" Ga.
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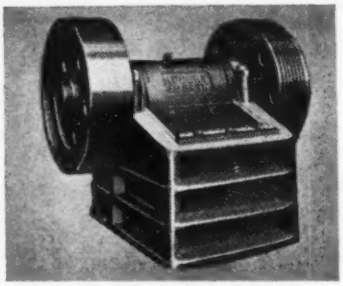

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100	600	Allis Ch.	440	Slip ring
100	720	G.E.	440	IM Slip ring
100	720	G.E.	440	IK Sq. cage
100	720	F. Morse	440	Sq. cage
100	900	Allis Ch.	440	Slip ring
100	1800	G.E.	2200	IK Sq. cage
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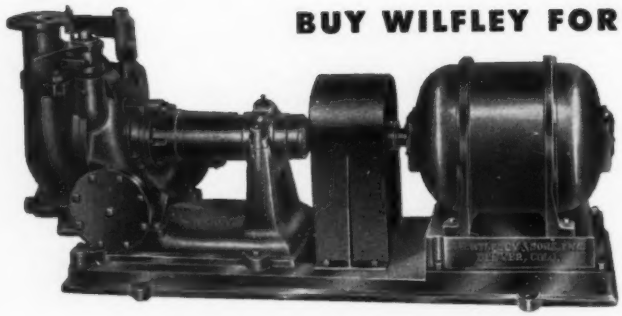

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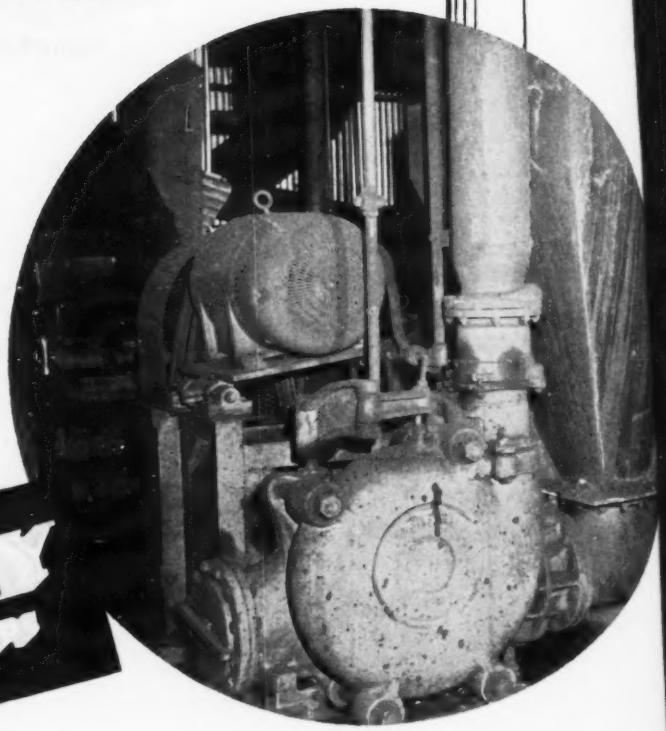

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